FEBRUARY 23, 1959

STEEL
The Metalworking Weekly

A PENTON PUBLICATION

Sulfamate Bath Produces Stressfree Nickel Plate

• Parts can take additional forming without peeling when they're plated with stressfree metal. Here's how a nickel sulfamate bath, used in automatic barrel plating equipment, can upgrade products and reduce production costs . . . . . Page 98

METALWORKING OUTLOOK . . . PAGE 37

Page 45 . . .

First Half Steel Output May Pass 62.6 Million Tons To Set Record

Page 54 . . .

Chances for Labor Law Reform

Page 60 . . .

Do Tariffs Help or Hurt Us?

Page 82 . . .

Coating Extends Draw Die Life

Page 86 . . .

Carbonitriding of Steel Parts Boosts Production, Cuts Costs

Page 111 . . .

Wabush Ore Development Speeded

LIGHT GAUGES

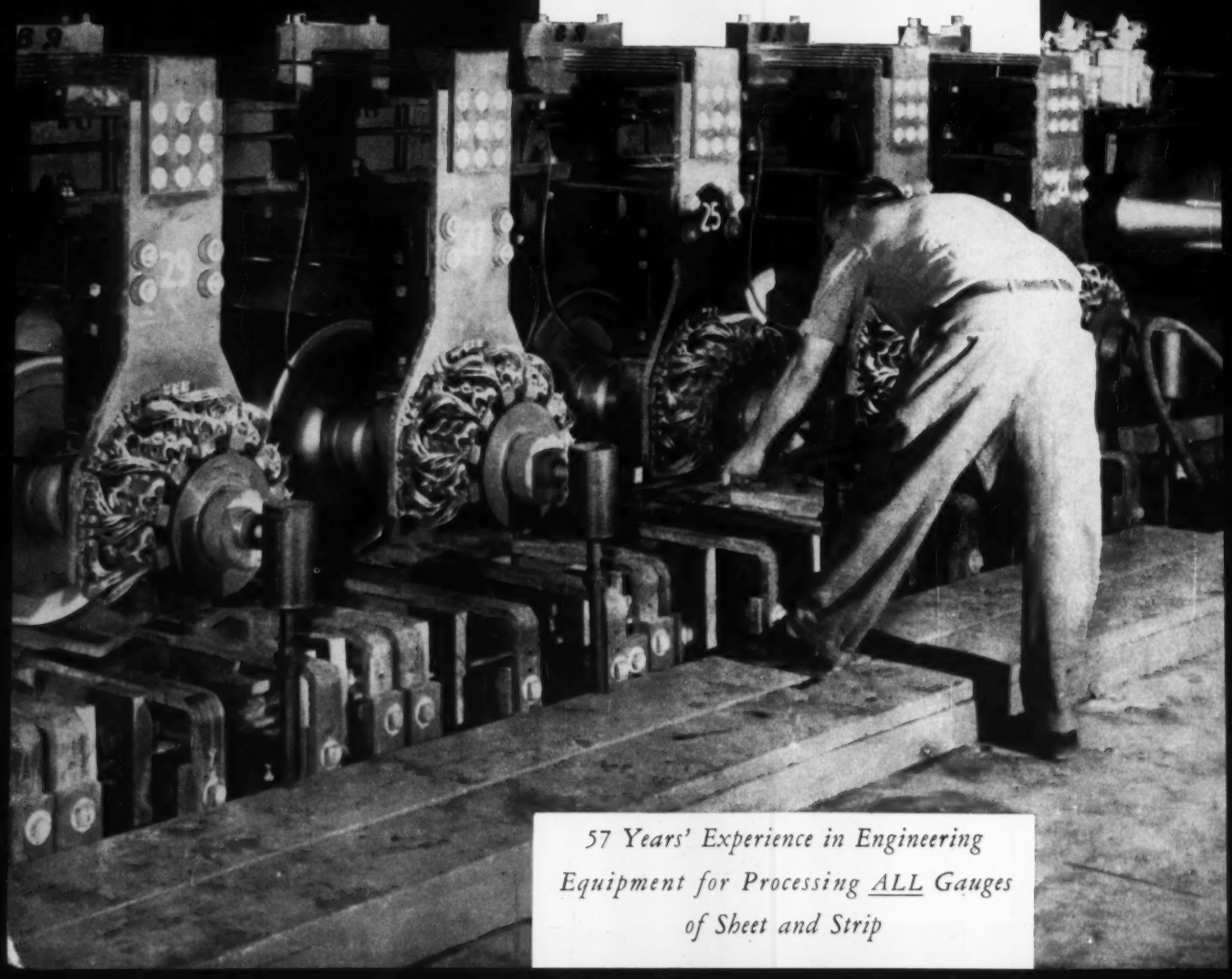
at High Speeds Need Rugged Equipment

Higher and higher speeds and lighter and lighter gauges in tin plate put a greater and greater demand on equipment. High-speed Continuous Processing Lines must be more rugged than ever before to stand up to 21-turn operation. Our experience with processing lines dates back to the earliest production of strip in coils. In those years and today, ruggedness of equipment has been a trademark of Aetna-Standard.

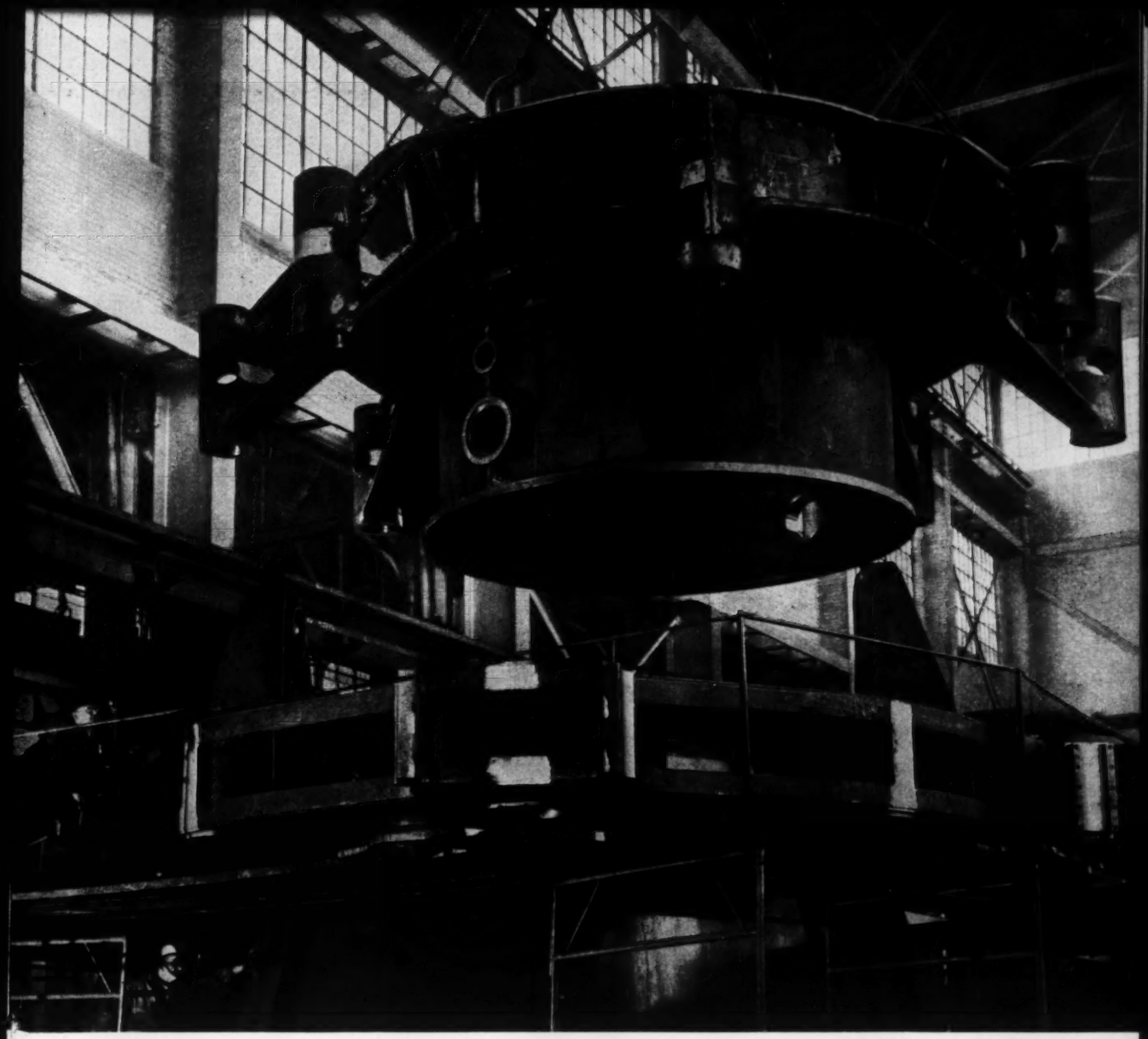
AETNA·STANDARD

The Aetna-Standard Engineering Company

FRICK BUILDING · PITTSBURGH, PA.
ELLWOOD CITY, PA., WARREN AND AKRON, O.



57 Years' Experience in Engineering Equipment for Processing ALL Gauges of Sheet and Strip



It simulates a ship in a storm-tossed sea

The machine which you see being put together here in Bethlehem's machine shops might properly be called the Great Imitator. It is a ship-motion simulator with an uncanny ability to reproduce the tossing of an ocean vessel. The simulator can rock and roll, buck and pitch, and otherwise carry on like a ship in heavy swells. It can even imitate a vessel pummeled by a hurricane.

Designed and built for the U. S. Navy by Loewy-Hydropress, a division of Baldwin-Lima-Hamilton, the 285,000-lb unit was conceived as a research tool for use at Cape Canaveral, Fla. There it should provide the Navy with valuable data in connection with the launching of missiles at sea.

That huge assembly, being lowered so carefully in the photograph above, is a Bethlehem weldment consisting largely of castings. The task of machining and assembling the many intricate parts was a major undertaking, but Bethlehem facilities were equal to the job.

Call us when we can be of service in the planning and building of specialized machinery. Our shop facilities are unexcelled, and our many years of experience with this type of work can be helpful to you.

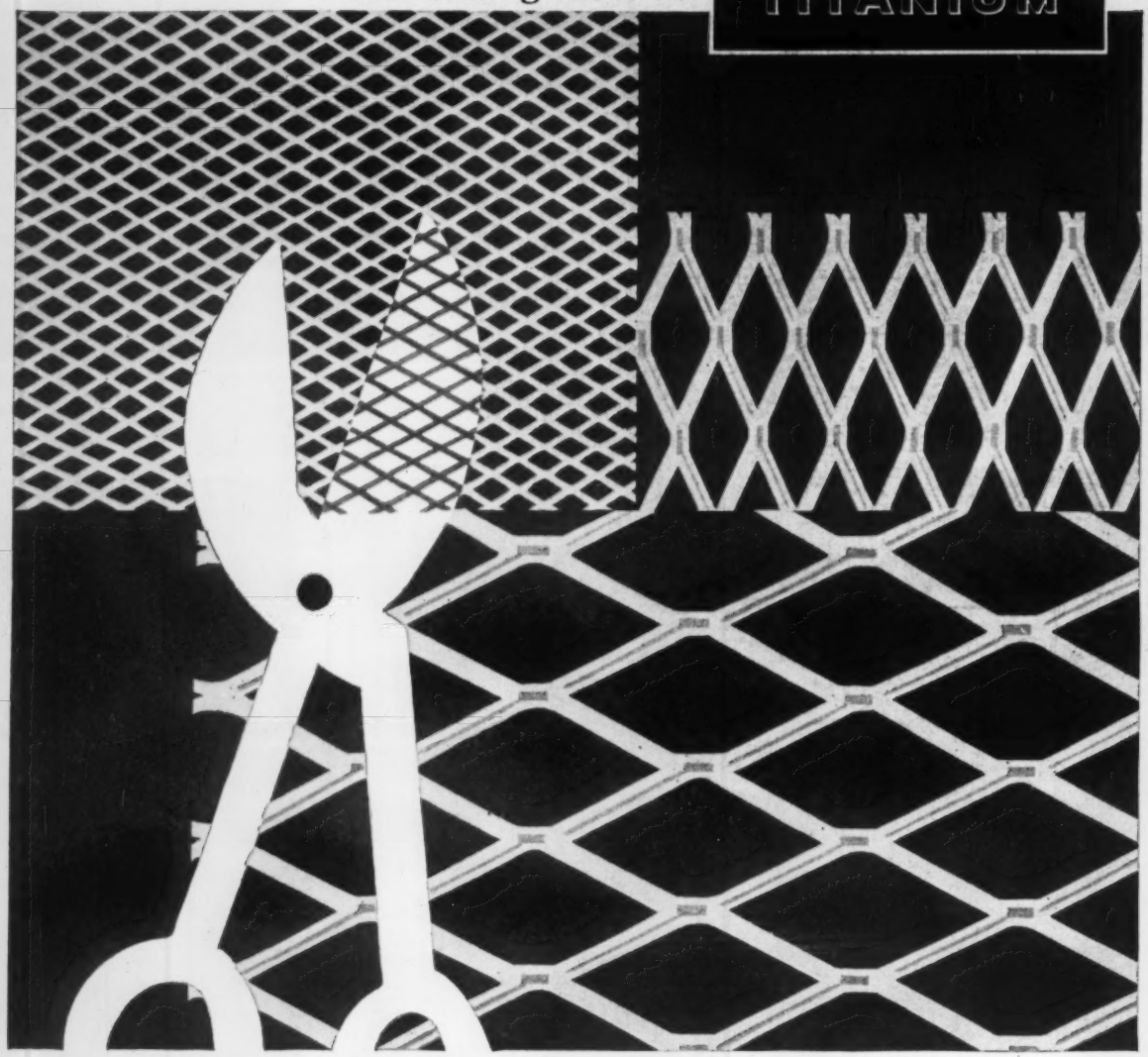
BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

Cost cutting ideas in **TITANIUM**



EXPANDED TITANIUM SHEET

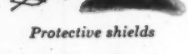
"opens up" new savings in corrosive plating applications

Now, cost-saving applications for titanium take another important step forward. Expanded titanium sheet, recently introduced by Mallory-Sharon, offers interesting possibilities for use in the plating and chemical processing industries.

Dip baskets

Filters

Its high corrosion resistance makes it ideal for use in acid plating, acid dipping baskets, and in protection shields for immersion heating electrodes. The new material is available in gauges from .015" to .125", from ⅛" to 1½" diamonds, and in standard 48" x 96" sheets.



Protective shields

Expanded titanium sheet is now available in production quantities. Prices vary with gauge and strand widths. For further information, write for Technical Data Sheet.

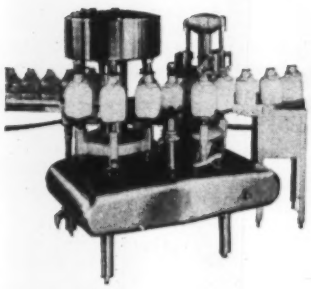
MALLORY SHARON

MALLORY-SHARON METALS CORPORATION · NILES, OHIO

Warner & Swasey No. 4 Turret Lathe machining stainless steel dairy equipment components (shown below) at Federal Mfg. Co., Milwaukee, Wisc.

Warner & Swasey No. 4 holds .0005" accuracy...

triples production rate for Federal Mfg. Co.



SPECIALIST producer of milk bottle filling and capping machines, Milwaukee's Federal Mfg. Co.—a small, but most progressive organization—is today enjoying a phenomenal growth. This is due to the dairy industry's enthusiastic acceptance of their new and unique 'Vacu-Matic' filling machines.

PROBLEM—Precision components of these machines—produced in average lots, ranging from 100 to 300 pieces—are of 303 stainless steel. Required machining tolerances were .0005", and surface finishes of 40 micro-inches had to be held in order to keep subsequent polishing costs to a minimum.

SOLUTION—Federal's Warner & Swasey No. 4 Ram Type Turret Lathe, combined with operator skill and a sound preventive maintenance program, adequately met the desired accuracy and surface finish specifications—and, in addition, increased production three times above rates obtainable on their older turret lathes.

OPERATOR REPORTS—"Ease of machine handling made possible our sizable production increase. We make full use of the lathe's 6 to 1 high-low shift and two-speed motor which instantly and effortlessly provide a choice of four speeds without preselection—a time-saver for changing speeds from turn, to ream, to cutoff, etc. In all, our No. 4 all-clutch hydraulic headstock, with its two-speed motor, provides a total of 24 *unduplicated* speeds—any of which can be preselected while under cut, and instantaneously thrown into action by the flip of a lever. We also like the higher speeds and the easier, faster handling of the apron controls."

This is the kind of production you can expect in your own shop when you replace older turret lathes with modern Warner & Swaseys. Call in our Field Representative to talk about specific applications in your shop.

WARNER & SWASEY
Cleveland
PRECISION MACHINERY SINCE 1880

YOU CAN PRODUCE IT BETTER, FASTER, FOR LESS . . . WITH A WARNER & SWASEY

8 coordinated Clevelands power National Tube's unusual tempering furnace

A total of 8 coordinated Cleveland Worm Gear speed reducers work in harmony to transmit power on National Tube's tempering furnace at McKeesport, Pa. Vital to their Warm Working Process, it heats pipe 900-1000° prior to entering the sizing mill.

Operating from a single power source these Cleveland right-angle drives handle the huge job of power transmission required to keep pipe production at high output rates.

That's a big reason why compact, rugged Cleveland Worm Gear drives are found in plants across the country where heavy-duty drives of proven dependability are required.

Cleveland's new Bulletin 145 gives the latest specifications on the entire line of speed reducers. Write for your copy today. The Cleveland Worm & Gear Company, 3270 East 80th Street, Cleveland 4, Ohio.

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This Week in STEEL The Metalworking Weekly

February 23, 1959
Vol. 144 No. 8

EDITORIAL 43

Is a steel strike necessary? President of USW is asked that question in an open letter.

SPECIAL FEATURE 98

You Can Make Nickel Plate Stressfree

Your worries about imperfect bonding and peeling of nickel plate disappear when you immerse parts in a nickel sulfamate bath before forming.

SERVICE FOR READERS
Opposite Page 8
File Western Union form to obtain information or services from advertisers in this issue.

WINDOWS OF WASHINGTON 54

Don't be misled if the Kennedy labor bill passes the Senate. It won't be a case of David slaying the giant.

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Three important signposts indicate that the recovery from the recession of 1958 is nearly complete.

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behind the scenes

Prognosticator's Pitfalls

Weathermen dislike being sent to Cleveland, because this city on the south shore of Lake Erie sits squarely on a storm track. Cold fronts, hot fronts, barometric pressure, prevailing winds, and line squalls frequently become mixed up. Everything might point to an impending deluge, so the weatherman calmly makes his prediction. An updraft from Lake Erie hits a downdraft from someplace else, so the storm veers and bursts harmlessly 20 miles from shore. Or, the weatherman will confidently announce that the blizzard sweeping across Indiana will miss Cleveland and bury London, Ont., instead. You guessed it: The Ohio metropolis is caught with its shovels down.

A magazine that attempts to predict steel production for the first half automatically shares the end of a limb with a Cleveland weatherman: They're both at the mercy of unstable factors. STEEL, however, figuratively takes a deep breath and announces that steel production in the first half of 1959 will exceed the all-time high recorded during the first half of 1956 (see story on Page 45).

Record First Half?

In some respects, the conditions that brought about the record steel production in the first half of 1956 may be repeated in '59. Like 1956, this year promises to be a strike year. Threats to production usually stir producers to greater efforts; consumers tend to stockpile, and industry gathers momentum, something like a river speeding up to the point where it plunges over a falls.

Will there be a steel strike? Will there be a compromise? Will the prolongation of this severe winter interfere with the delivery of iron ore from the upper lakes? All the factors governing the situation are available for analysis—and when you study them, you'll find yourself in the same position as the Cleveland weatherman: You takes your facts, and you takes your chances!

Purloined Paragraphs

"You could have knocked me over with a feather," said Associate Copy Editor Glenn Dietrich, coining an expression on the spot, "when I opened a copy of *The Oil & Gas Journal* and saw that they had lifted a story you had written about how to louse up a trade exhibit!"

"Why, that's probably a compliment," said Associate Managing Editor John Morgan, author of the original article, and target of Dietrich's remarks.

"Compliment, my foot!" exclaimed Dietrich. "It's more like plag . . ."

"Say no more," said Honest John. "*The Oil & Gas Journal* is too highly respected a magazine. By the way, don't let ol' Shrdlu get hold of this. You know how he loves to make mountains out of molehills!"

Salute d'Amour

Because of certain press schedules, this page was written on Feb. 14, a day when universal love runs rampant. We had been accused of neglecting good St. Valentine, so this is as good a time as any to run some lines written by a canny Scottish bachelor (with apologies, of course, to Robbie Burns):

Wee, sleekit, tim'rous Cupie,
Wha's the lover wha can dupe ye?
Thou'rt aye a canny, canny shooter;
Wi' dart and a' nane be astuter!
But hoot awa', thou guilefu' fairy,
And flee awa' on pathways aery;
Forbye, thou naked bairn, I shiver
When ilka darts come frae they quiver.
I ken thee fine, thou bonny bowman—
Thou flittin', dartin', master showman,
Wha gang aboot in waefu' stitches,
Sae bare o' rump, and bare o' breeches.
Thou troublemaker, Dan McCupid!
Awa' wi' a' thy arts so stupid.
Ye dinna ken how oft' ye harrow
A muckle hearts wi' ill-sped arrow.
Although thou huntest hearts in pairs,
Ye blunder oft' in these affairs;
Sae while the writer raves and rants on,
Ye'd best rin hame and put some pants on!

This Doll Digs Digits

Our most delightful correspondent, Charlsie Vunovic, secretary, General Steel Casting Corp., Granite City, Ill, invites your attention to the following brain teaser:

"After you have filled in the missing digits, it will be noted that either one of two superfluous digits could have been omitted, and the puzzle still solved with the same answer. Can you find the superfluous digit or digits?"

```
   . 7 .
   . 6 .
 -------
   . . 3 .
   . 6 .
 3 . . .
 -------
 . 1 . 1 .
```

Shrdlu

(Metalworking Outlook—Page 37)

ANOTHER NEW USE
FOR BYERS
AMBALLOY STEEL

AMBALLOY TAKES ON TOUGHEST TERRAINS

Gorging this sod-buster's mouth is a test for scraper blade durability. High-strength Amballoy passes this punishing test with excellent resistance to abrasion, corrosion, shock and fatigue stress.

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Amballoy's range of applications is broad. The Byers metallurgist can match the special qualities of our electric furnace steels to your critical parts requirements. He *knows* his metals. Why not call him? Contact: A. M. Byers Company, Clark Building, Pittsburgh 22, Pa.

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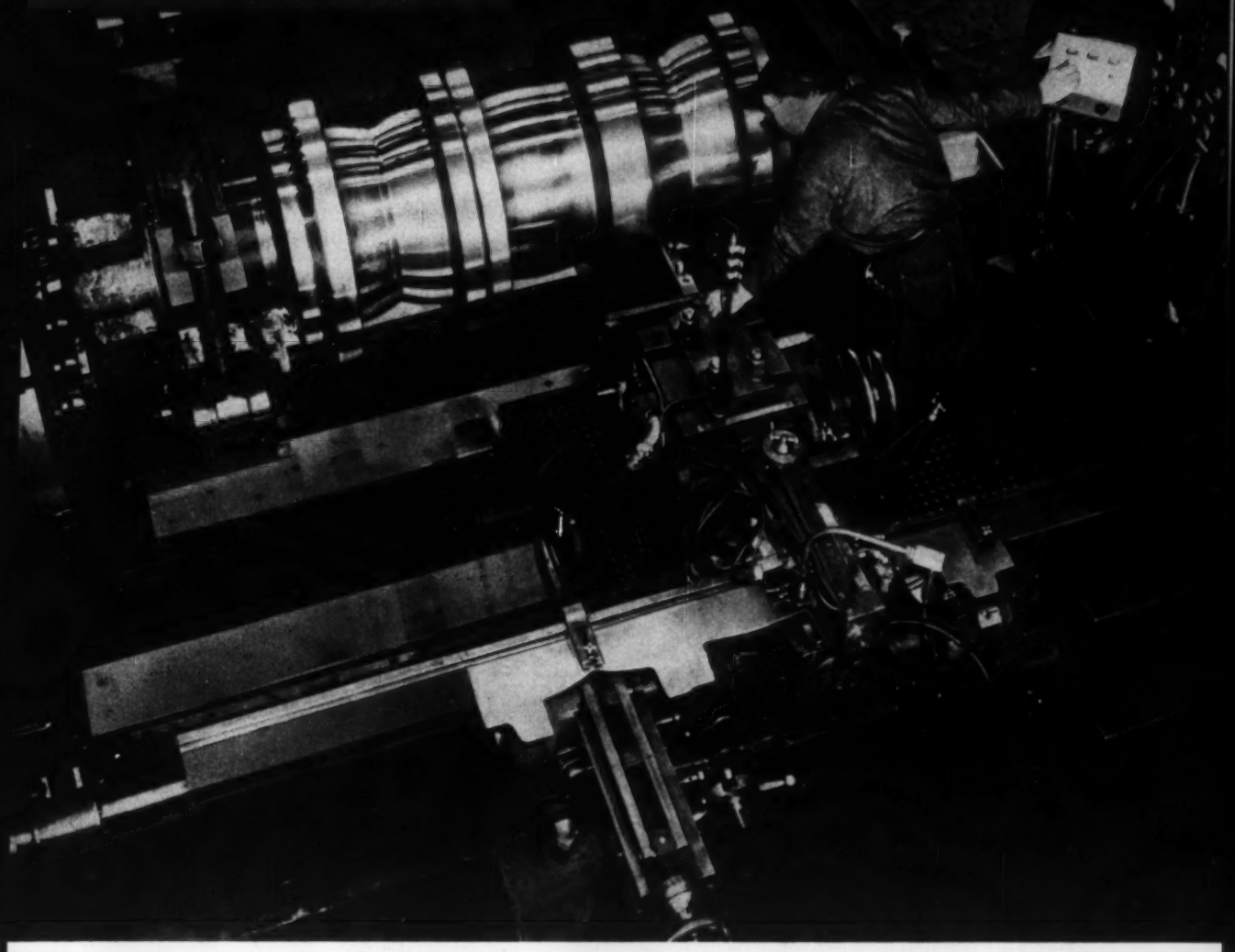
STEEL

ROLL SHOPS REPORT:



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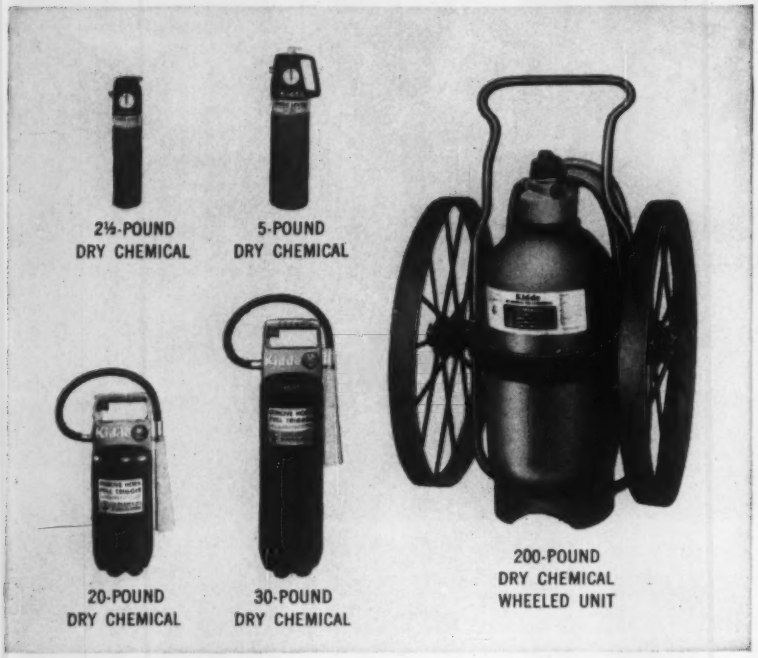

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The 200-pound Kidde pressurized wheeled unit discharges a 40-foot dry chemical stream faster, has an *extra* 50 pounds of fire-smothering dry chemical to knock down fire quicker. It's faster and easier to operate... just remove pin, swing toggle lever, and flip on-off lever. Easy to maneuver because of its low center of gravity and larger wheels. Truly a one-man fire engine!

All Kidde extinguishers are granted top rating by Underwriters' Laboratories, are the finest extinguishers on the market today. Get more information about this *complete* line of *full-power* fire fighting equipment. Write to Kidde today!

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LETTERS
TO THE EDITORS

A Message for the Firm

I liked your editorial "Got Too Many People?" (Jan. 26, p. 35), and feel definitely that there is a message here for our company. May we have 125 reprints?

Dutch Forsythe
President
National Automatic Tool Co. Inc.
Richmond, Ind.

New Paint Interests Reader

In the Technical Outlook item "Identification" (Jan. 12, p. 69), you mention a new paint which makes it possible to letter and number steel parts permanently. May I have more information on this product?

F. A. Palmer
Advertising Manager
Cuno Engineering Corp.
Meriden, Conn.

• *We suggest you write the paint producer, Phillips Products Inc., 1435 E. 17th St., Cleveland 14, Ohio.*

Shows Interest in Hard Sell

We at Clark have read with a great amount of interest "The Hard Sell Is Back" (Dec. 29, 1958, p. 25). We would like to request permission to reprint this article in our sales magazine which goes to 500 of our salesmen in the U. S. and Canada.

Glenn A. Christians
Advertising Manager
Clark Equipment Co.
Battle Creek, Mich.

• *Permission granted.*

Adapt Methods for Their Tube?

The article, "Here Are Two Shortcuts for Complex Parts" (Dec. 29, 1958, p. 64) illustrates two types of metal processes, metal gathering and Flotrusion, which may help simplify production methods of the thin wall tubing which we anticipate fabricating.

We are sending two prints which illustrate the requirements of the tubes we are manufacturing.

Any information you can furnish on

(Please turn to Page 12)

How overhead handling saves space

Automatic Electric, winner of an award for one of 1957's best ten new plants, uses Whiting Trambeam Overhead Materials Handling Systems. A Trambeam Crane System moves finished products from packaging and crating area to temporary storage in the shipping room. Result: aisle space is minimized – total cubic space is more effectively utilized.

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LETTERS

(Concluded from Page 10)

these requirements after you have had the opportunity to inspect the prints would be greatly appreciated. We would like to see if it is possible to adapt our requirements to these new production methods.

E. J. Kindl

W. J. Schoenberger Co.
Cleveland

● *Both look possible, but we are checking further for you.*

L-D Production: 3 Million Tons

We'd like to point out the inaccuracy in the headline used over the statement of C. R. Austin in your yearbook issue (Jan. 5, p. 193). Instead of One-Third, the headline should have indicated that U. S. L-D production in 1959 is estimated at more than 3 million tons. We'd appreciate it if you'd tell your readers.

R. A. Bateman

Manager of Public Relations
Kaiser Engineers Div.
Henry J. Kaiser Co.
Oakland, Calif.

More Information Wanted

In the Jan. 26 issue of STEEL, p. 43, there was an article titled "Wanted: Executives." I would like to obtain more information on the subject and would appreciate it if you would send me the address of Heidrick & Struggles Corp.

H. A. Grass

Manufacturing Engineering
Chicago Stamping Plant
Ford Motor Co.
Chicago Heights, Ill.

● *Heidrick & Struggles Corp.'s address is 20 N. Wacker Ave., Chicago, Ill.*

Discuss Saving Time

May I obtain 20 copies of "Memo To: Busy Executives, Subject: How To Save Time" (Nov. 10, 1958, p. 86). This was a wonderful article and I'd like to use it in a discussion at our next division meeting.

W. P. Johnson

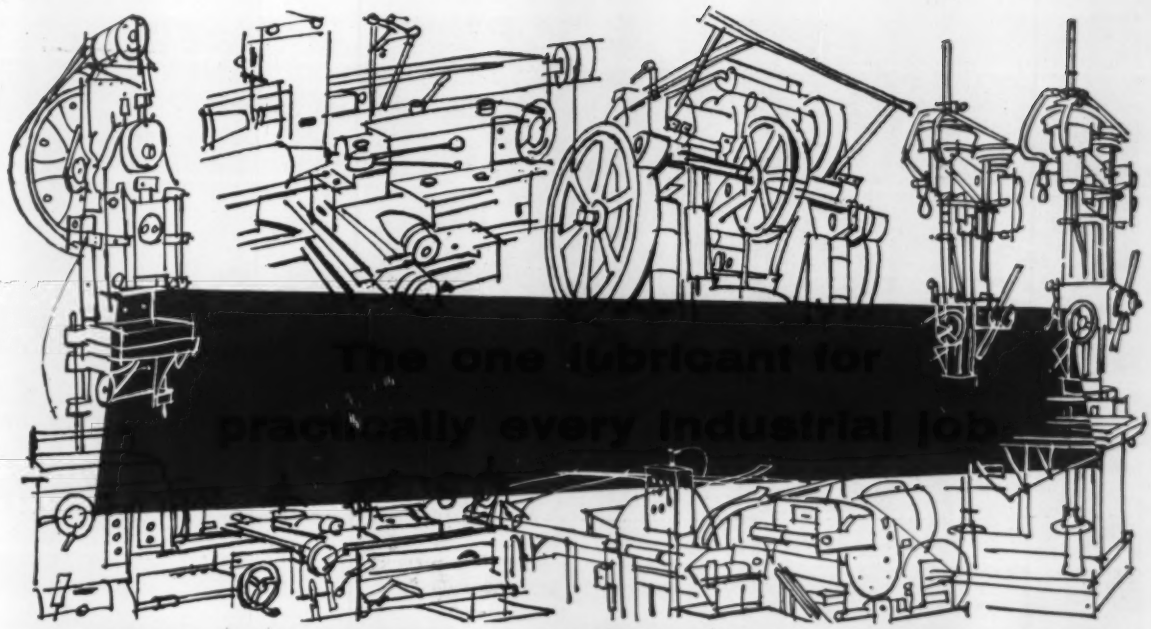
General Manager
Clipper Transit Co.
Manitowoc, Wis.

Sends Suggestions

I think your use of color for "Metalworking Outlook" is well taken. May I suggest you also use a distinctive color for your "Windows of Washington" and the editorial page? They're always worthwhile reading and passing on to members of my staff.

E. R. Lind

Manager
Office Standards & Methods Div.
Joseph T. Ryerson & Son Inc.
Chicago



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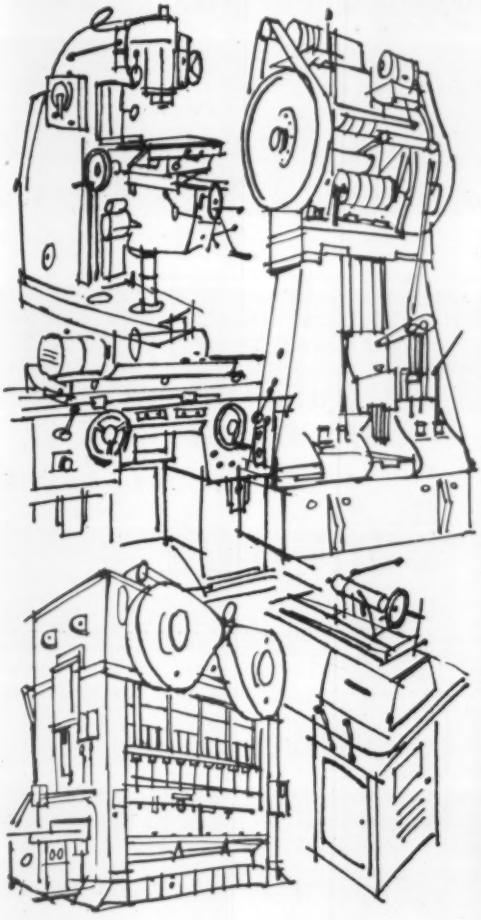

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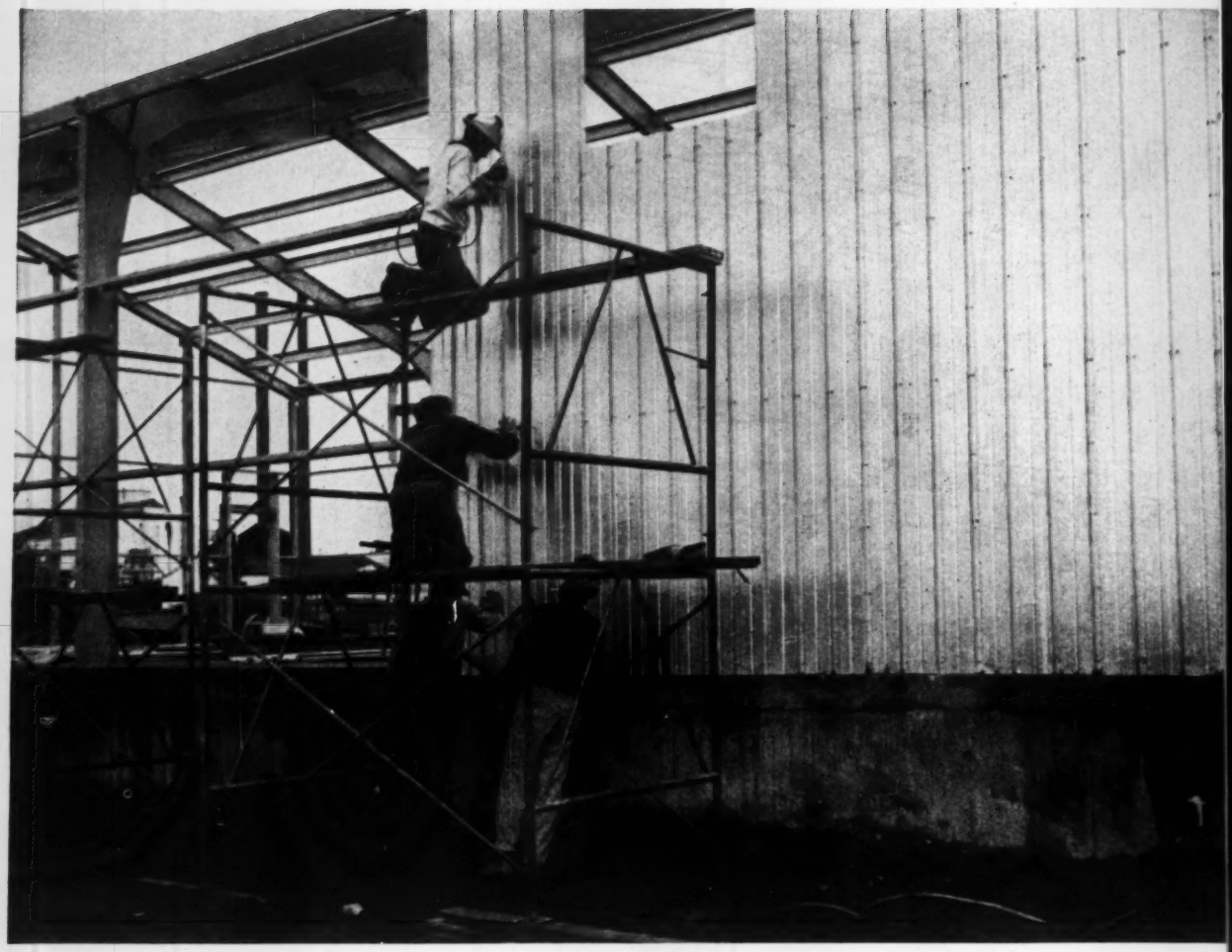

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Truscon Steel "Budget Buildings" are the fast, economical way to provide warehousing, enlarge manufacturing facilities, erect field offices at lowest cost. Available with 3-week delivery from order to job site!

Basic framework is of rigid frame design, shop fabricated from hot rolled structural sections, complete with all necessary connection plates and anchor bolts. Purlins and girts are cold formed channel sections, bolted with standard machine bolts.

Roofing and siding are 26-gage galvanized roll formed ribbed sheets 24″ wide, and in continuous lengths. Sheets are rolled from Republic tight-coated, continuous hot dip galvanized steel . . . will not flake, crack, or peel. More rust resistant than ever and no painting needed.

Truscon "Budget Buildings" are available in widths of 32, 36, 40, 44, and 48 feet—12- and 14-foot heights, in any lengths necessary. All roofing, siding, windows, doors, and hardware are shipped to the job site as a package.

To learn more, call your Truscon representative, or write for attractive, full-color brochure.

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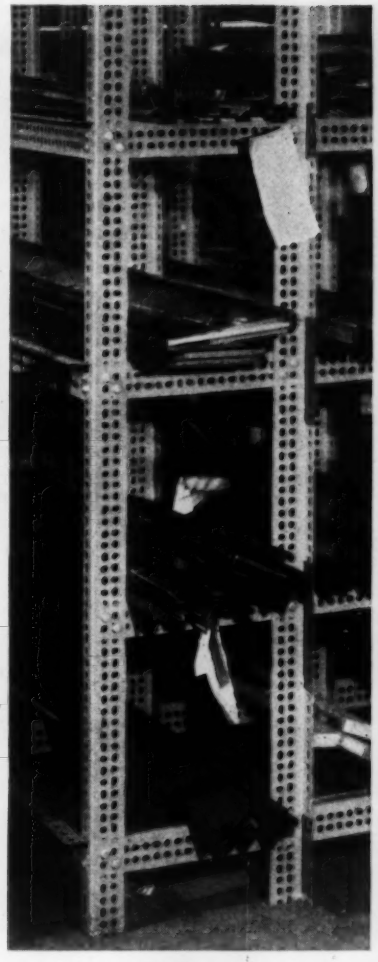

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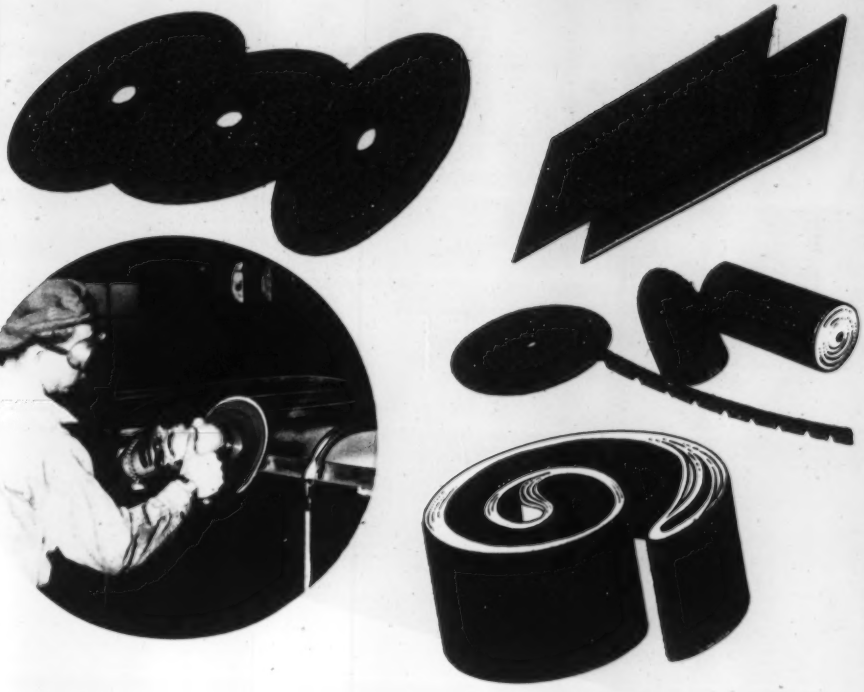

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Fast-cutting · Flexibility · Safety · Economy · Sharpness · Toughness

Speed-wet Metalite (GREEN-BAK) Fibre Discs

A grit 24 Metalite disc mounted on an air portable tool is removing welds from the top radius of steel washer tubs. A steel disc pad is used to back up the grinding disc.

Draw marks on the top side of this steel cooking well are being smoothed with a Metalite fibre disc mounted on a portable grinder and running at 5000 rpm.

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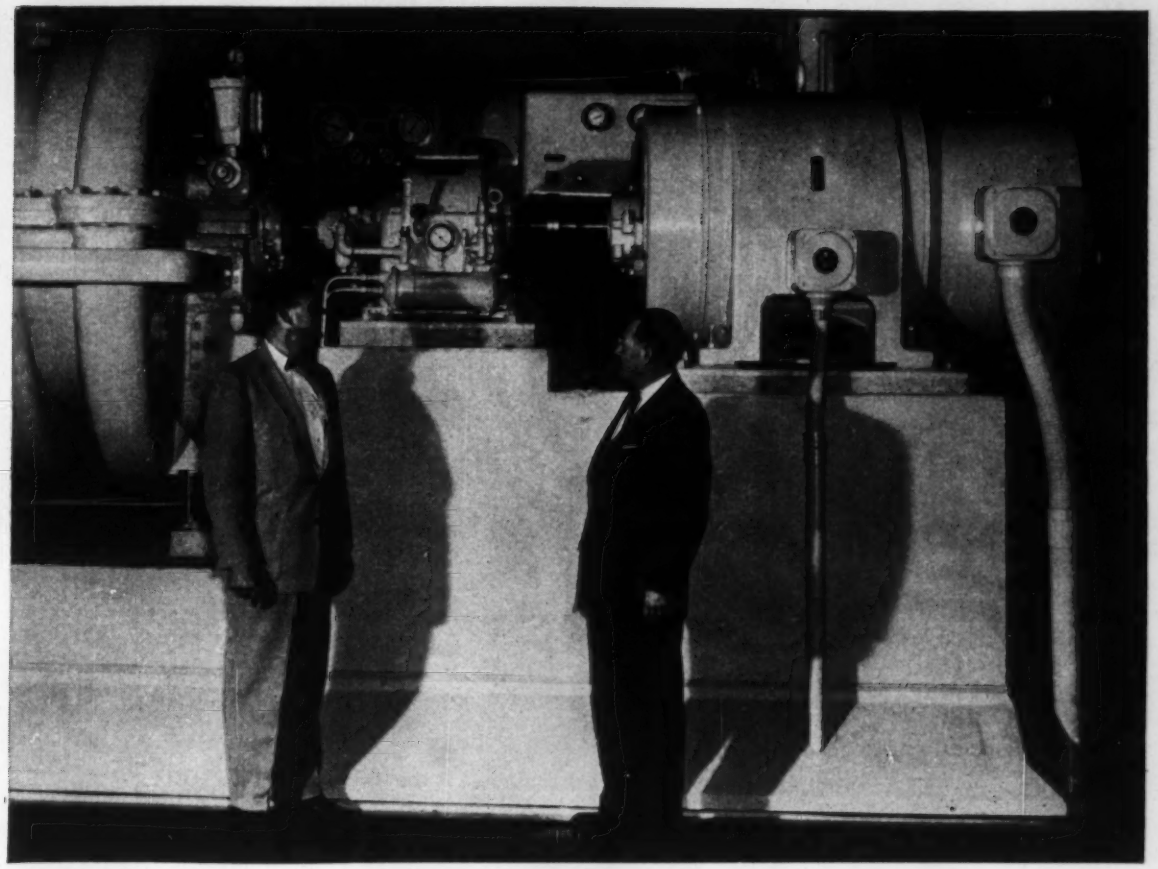

One of two Fairbanks-Morse 4160 volt, 700 hp. slip ring motors which power Carrier refrigeration compressors.

8-speed climate with F-M motors!

Flexible control of new air conditioning system saves power and maintenance for Union Oil Center

Through a new Carrier dual-duct high-velocity system powered by Fairbanks-Morse slip ring motors, the magnificent new Union Oil Center in Los Angeles is ideally air-conditioned at minimum power and maintenance cost.

Providing 8 speeds between 75 and 100 percent of capacity, the two F-M 700 hp. motors make it possible to match operating rpm. of compressors, chillers and condensers to any specific condition. The new Center covers 5 acres, with 1200 employees occupying 426,000 square feet of the office space in a complex of four buildings—an installation requiring the finest in air-conditioning equipment and components.

Fairbanks-Morse offers the distinct advantage of a broad range of alternating and direct current motors, in all types, and in ratings from ½ to 10,000 hp.

For expert assistance in specifying, write Fairbanks, Morse & Co., 600 South Michigan Ave., Chicago 5, Illinois.

New Union Oil Center in Los Angeles.

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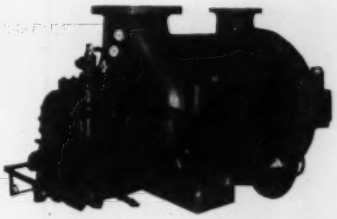
a name worth remembering when you want the BEST

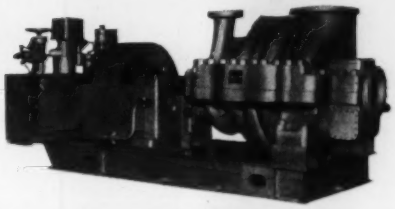
ELECTRIC MOTORS • GENERATORS • PUMPS • SCALES • DIESEL, DUAL FUEL AND GAS ENGINES • LOCOMOTIVES • COMPRESSORS • MAGNETOS • HOME WATER SYSTEMS

John L. Parris, *Manager Centrifugal Compressor Sales, The Cooper-Bessemer Corporation, explains...*

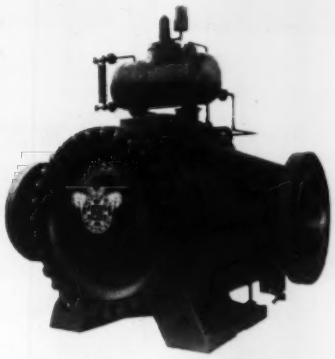
How you gain four ways when you specify Cooper-Bessemer Centrifugal Compressors



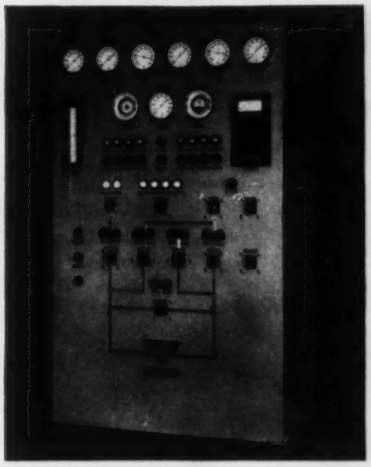
Horizontally split, process air or gas centrifugal compressor. Range: Up to 100,000 cfm.



Horizontally split, intercooled centrifugal compressor designed for low cost shop and process air and gas. Up to 30,000 cfm.



Pipeline centrifugal booster with a history of record-breaking performance. Up to 20,000 bhp.



Installations can be integrated with Cooper-Bessemer En-Tronic Controls all the way from simple monitoring to complete system automation.

Barrel type centrifugal compressor for gas and air at pressures up to 5000 psi.

To get the most for your compressor dollars, it will pay you to check into Cooper-Bessemer Centrifugal Compressors because these fully-proved products offer you a combination of four outstanding advantages:

1. You get a design that's matched to your needs. A wide range of types and sizes of Cooper-Bessemer Centrifugal Compressors are available to assure optimum performance on *your* processing or air supply application.

2. You get unsurpassed quality. The designs include many field-proven distinctive features. Cooper-Bessemer's high standards of materials and craftsmanship are applied to every component of these precision-built units... to assure utmost reliability.

3. You can get undivided responsibility. We can engineer the entire compressor installation, including drive and controls. Cooper-Bessemer En-Tronic Controls are available to provide any degree of automation.

4. You get service for most profitable performance. Our outstanding field service and warehouse facilities assure prompt attention to your operating needs... with resulting reduction in your inventory and downtime.

Our nearest office will gladly supply complete information on Cooper-Bessemer Centrifugal Compressors to meet your needs exactly. Call them today.

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How Warren Pouyer cut grinding

Six years as a tool and die maker gave Bay State's Warren Pouyer a basic knowledge of precise metal working problems that many an "expert" would envy. For the last nine years, he has specialized in abrasives and has gained a tremendously wide knowledge of grinding methods and materials.

Moog operator gets heavy, rapid stock removal using Bay State wheel to grind eye of automobile spring leaf.

costs 1/3 at Moog Industries

Too many wheels were being used up too fast. That was the basic problem in the spring eye grinding operation at Moog Industries, St. Louis, Mo. A leading manufacturer of truck, trailer and automobile springs, Moog makes a complete line of front-end, chassis parts . . . and in this highly competitive business, keeping grinding costs down is vitally important.

So they called in Warren Pouyer of Bay State distributor Mill Supply & Machinery Company and he spotted the trouble right off the bat: disc grinding wheels of a specification that looked as if it *ought* to be right but wasn't. Pouyer specified the proper Bay State wheel using a semi-friable type of aluminum oxide with a unique combination of grit sizes. Production increased 33% per wheel without loss of operation speed.

Since then, the Bay State wheel has been competitively tested over and over again and it has come out on top every time . . . a tribute to Warren Pouyer's ability to specify exactly the right wheel, in this case the first time, and to Bay State's ability to reproduce a given spec *exactly* and *consistently*.

Warren Pouyer doesn't solve all his grinding problems as quickly as this. Like all Bay State representatives, he's trained to study every problem *thoroughly*. And whether a particular problem has a simple solution or a tricky one, you can be sure *your* Bay State man will stick to it until he works out a practical, economical answer. *Better grinding at lower cost—that is his business.*

BAY STATE WHEELS of PROGRESS

BAY STATE ABRASIVES

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WELDYNAMICS

NEWS ABOUT ARC WELDING AT WORK CUTTING COSTS

ATLAS SOLVES HIGH COST PROBLEMS

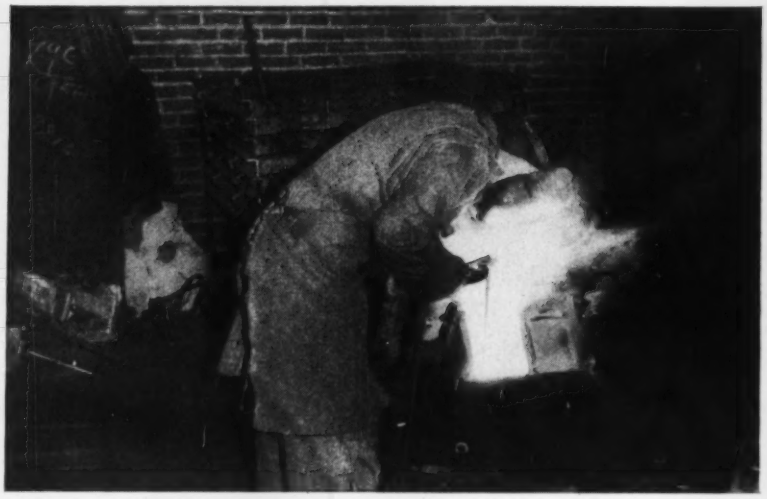
High welding costs were eating away at profits and making it tougher to bid competitively on heavy fabricating jobs at the Atlas Machine and Iron Works in Arlington, Va.

Werner Quasebarth, production manager and his brother, Bill Quasebarth, plant engineer, decided immediate action had to be taken. Since most of the work coming out of their shop is welded, it was natural that their welding operations come under scrutiny first.

To help them analyze all their welding procedures and processes they asked Jim Clauson, a welding engineer from Lincoln, to conduct a survey of their shop in an effort to pinpoint inefficiencies.

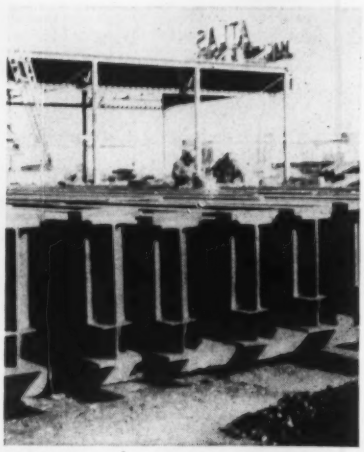
Bill Quasebarth and Jim Clauson checked every welding operation in the shop. They compared electrodes and processes for operating factor, speed, weld quality and appearance. As a result of the survey several improvements were made which are expected to pay off in cost reductions of ⅓ or more.

Bill Quasebarth, Plant Engineer, found the way to cut costs and improve the product.



Bridge bearings are welded manually with iron-powder Jetweld electrodes.

The most dramatic improvement was made on the process for welding cover plates on girders. Welding manually, Atlas welders have been able to complete 12 actual feet of $\frac{5}{16}$" fillet welds per manhour. By utilizing two Lincoln Mechanized "Squirt" welders which are capable of welding 50 feet of $\frac{5}{16}$" fillet per machine hour, Atlas was able to increase overall production 50% on this operation.



Welding cover plates on bridge girders. A switch to semi-automatic has upped production 50%, improved weld quality.

For short welds, not accessible to the semi-automatic or automatic machines, iron-powder Jetweld electrodes were found to offer greater speed, higher operating factor and better welds.

Werner Quasebarth says, "We're grateful to Lincoln for helping us with our cost problems. We've learned from experience that the advice of Lincoln engineers is sound. We've been skeptical in the past, but we've found the Lincoln man is usually right."

THE LINCOLN ELECTRIC COMPANY

Dept. 1648 • Cleveland 17, Ohio

The World's Largest Manufacturer of Arc Welding Equipment

CALENDAR
OF MEETINGS

Feb. 25-27, Electronic Industries Association: Annual industrial relations conference, Chase-Park Plaza Hotel, St. Louis. Association's address: 1721 DeSales St. N.W., Washington 6, D. C. Secretary: James D. Secrest.

Feb. 26-27, Alloy Casting Institute: Winter meeting, Boca Raton Hotel, Boca Raton, Fla. Institute's address: 286 Old Country Rd., Mineola, N. Y. Executive vice president: E. A. Schoefer.

Mar. 8-11 American Society of Mechanical Engineers: Gas turbine power conference and exhibit, Netherland-Hilton Hotel, Cincinnati. Society's address: 29 W. 39th St., New York 18, N. Y. Secretary: O. B. Schier.

Mar. 9-10, International Acetylene Association: Annual meeting, Roosevelt Hotel, New Orleans. Association's address: 30 E. 42nd St., New York 17, N. Y. Secretary: L. G. Matthews.

Mar. 9-10, Steel Founders' Society of America: Annual meeting, Drake Hotel, Chicago. Society's address: 606 Terminal Tower, Cleveland 13, Ohio. Executive vice president: F. Kermit Donaldson.

Mar. 9-12, American Society of Mechanical Engineers: Aviation conference, Statler-Hilton Hotel, Los Angeles. Society's address: 29 W. 39th St., New York 18, N. Y. Secretary: O. B. Schier.

Mar. 9-13, National Association of Manufacturers: Institute on industrial relations, Hollywood Beach Hotel, Hollywood, Fla. Association's address: 2 E. 48th St., New York 17, N. Y. Institute's director: Sybyl Patterson.

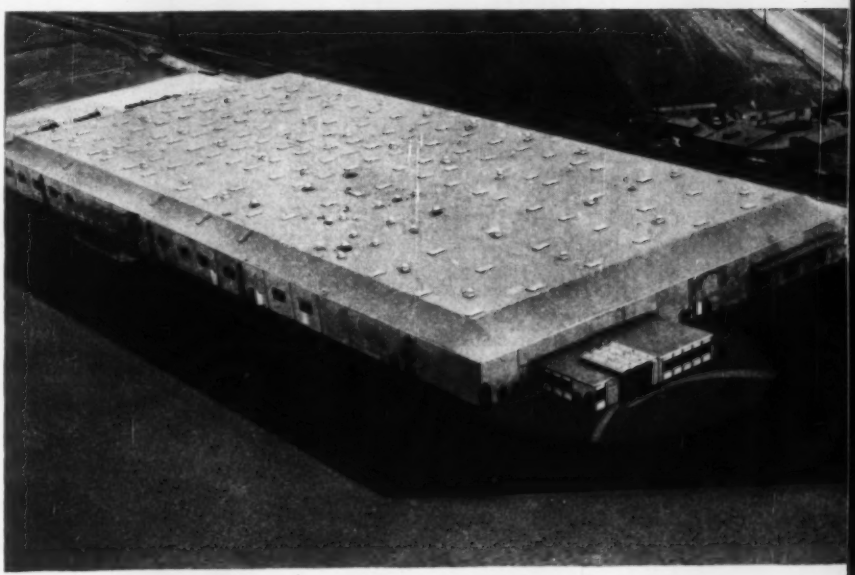
Mar. 10, Society of American Military Engineers: Symposium on industry and defense, Penn-Sheraton Hotel, Pittsburgh. Information: Miss Mary Busch, Pittsburgh Post, Society of American Military Engineers, 925 New Federal Bldg., Pittsburgh 19, Pa.

Mar. 11-12, Instrument Society of America: Annual iron and steel conference, Pittsburgh. Information: R. E. Blackwell, Pittsburgh Section ISA, Box 1346, Pittsburgh 30, Pa.

Mar. 11-13, Pressed Metal Institute: Spring technical meeting, Pick-Congress Hotel, Chicago. Institute's address: 3673 Lee Rd., Cleveland 20, Ohio. Managing director: Harold A. Daschner.

Mar. 16-18, Society of Automotive Engineers: National passenger car, body, and materials meeting, Sheraton-Cadillac Hotel, Detroit. Society's address: 485 Lexington Ave., New York 17, N. Y. Secretary: John A. C. Warner.

CAMPBELL CHAIN OPENS NEW PLANT



Now, Complete Chain Making Facilities For The First Time On The West Coast

Campbell Chain's new plant at Alvarado, California is *the most modern chain plant in the nation.* The completely integrated plant is equipped to supply Campbell warehouses in Portland, Seattle and Los Angeles, and makes possible same-day or overnight shipment of Campbell Chain's complete line of welded and weldless chain.

The Alvarado plant marks a major development in the expansion of the company, adding to manufacturing facilities at York, Pa. and West Burlington, Iowa, and warehouses across the nation.

CAMPBELL CHAIN

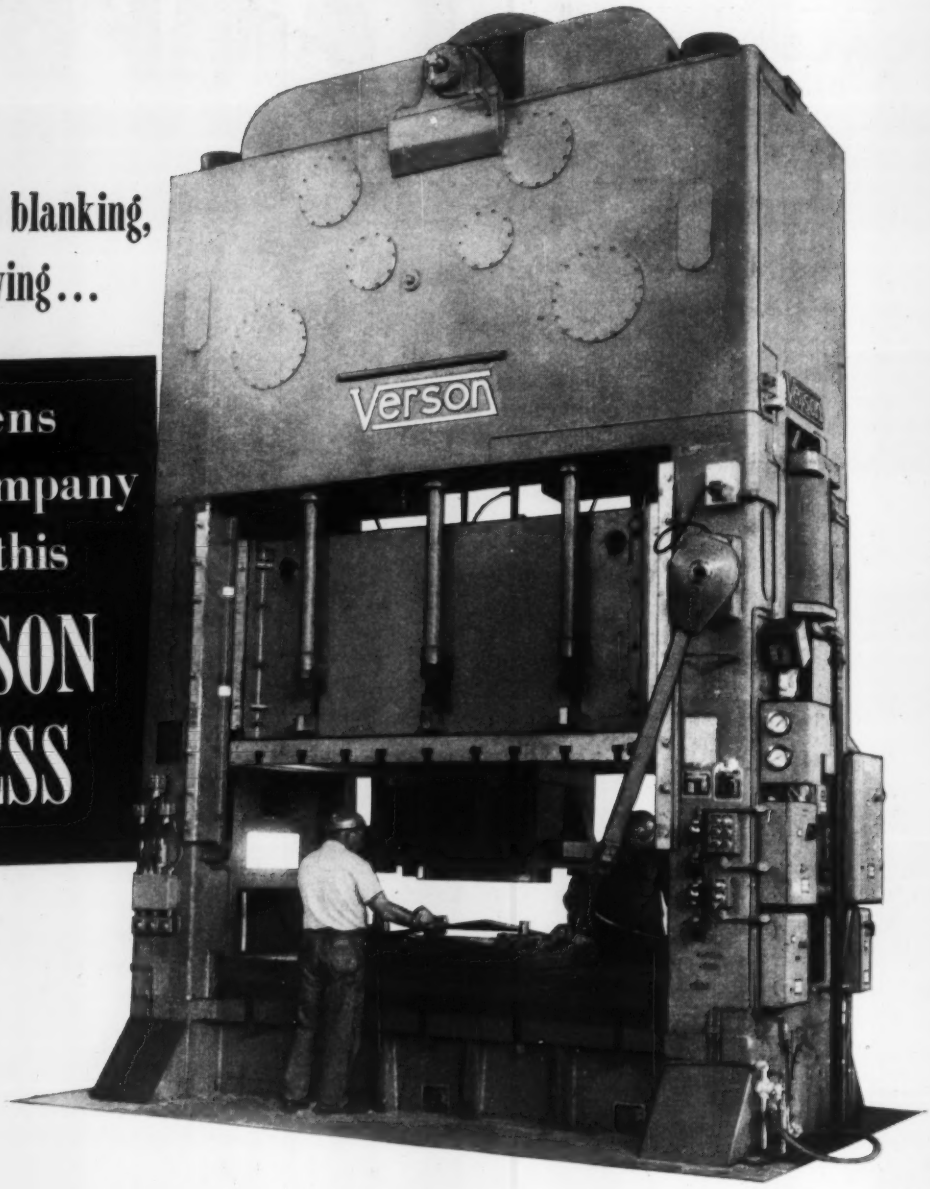
CAMPBELL CHAIN *Company*

York, Pa.—W. Burlington, Iowa—Alvarado, Calif.

E. Cambridge, Mass.—Atlanta, Ga.—Dallas, Texas
Chicago, Ill.—Seattle, Wash.—Portland, Ore.
San Francisco and Los Angeles, Calif.

For punching, blanking, forming, drawing...

Lukens Steel Company uses this VERSON PRESS



Here's another example of the versatility of Verson Presses. This 600 ton eccentric, installed at Lukens Steel Company, Coatesville, Pennsylvania, performs a wide variety of work. Punching . . . blanking . . . forming . . . drawing . . . the Verson Press handles them all.

This machine has a 14″ stroke with 10″ power adjustment of the slide. Area of the slide and bolster is 54″ x 108″. The press operates at 14 SPM and has a drawing speed of 51 FPM. A Verson Cascade lubrication system automatically supplies oil to all lubrication points on the press. Should a lubrication failure occur, the press is stopped automatically.

Big job . . . small job . . . there is a Verson Press to meet your needs. When requirements call for great versatility . . . men who know presses . . . depend upon Verson. Whatever your requirements, it will pay you to talk to Verson first.

A Verson Press for every job from 60 tons up.

210

ORIGINATORS AND PIONEERS OF ALLSTEEL STAMPING PRESS CONSTRUCTION

VERSON ALLSTEEL PRESS CO.

9318 S. KENWOOD AVENUE, CHICAGO 19, ILLINOIS • 8300 S. CENTRAL EXPRESSWAY, DALLAS, TEXAS

MECHANICAL AND HYDRAULIC PRESSES AND PRESS BRAKES • TRANSMAT PRESSES • TOOLING • DIE CUSHIONS • VERSON-WHEELON HYDRAULIC PRESSES

New ALLEN-BRADLEY OILTIGHT PRESSURE SWITCHES

Bulletin 836 Type T

Both operating pressure and differential are adjustable on these new A-B oiltight pressure switches. Operating pressure is externally adjustable, and setting shows on calibrated scale. A trip indicator shows operating point.

For machine tool hydraulic systems—operating at pressures up to 5,000 psi

Especially designed for heavy duty industrial applications, these new Allen-Bradley oiltight high pressure switches assure long, trouble free life. The attractive die-cast aluminum enclosure is completely sealed to exclude oil and water. The snap-action switch mechanism maintains its high contact pressure to the point of switchover—no matter how slowly it is approached. Contact chatter is eliminated—trouble free contact life is increased. The contact block has two isolated circuits with one N.O. and one N.C. set of contacts.

Send for complete information on this newest addition to Allen-Bradley's wide line of *quality* pilot controls.

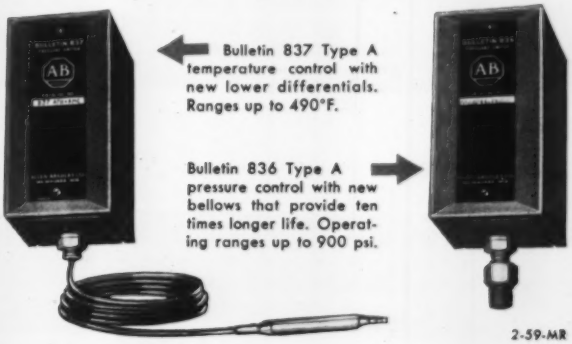
Allen-Bradley Co., 1316 S. Second St., Milwaukee 4, Wis.
In Canada: Allen-Bradley Canada Ltd., Galt, Ont.

ALLEN-BRADLEY
MOTOR CONTROL
QUALITY

A-B QUALITY

Internal view of piston design used on units for systems above 500 psi. Bellows type construction is used up to 500 psi.

Also...A New Line of Pressure and Temperature Controls with Lower Differentials



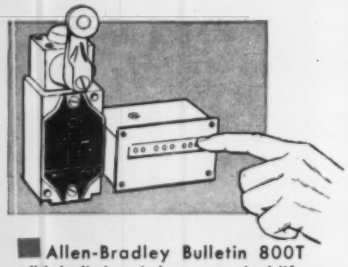
Bulletin 837 Type A temperature control with new lower differentials. Ranges up to 490°F.

Bulletin 836 Type A pressure control with new bellows that provide ten times longer life. Operating ranges up to 900 psi.

2-59-MR

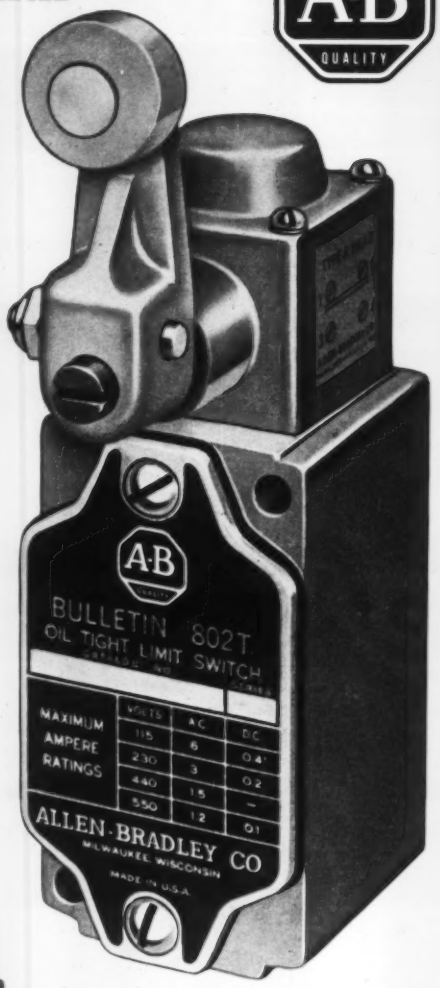
Allen-Bradley is not satisfied until Limit Switch Life runs into

MANY MILLIONS OF OPERATIONS



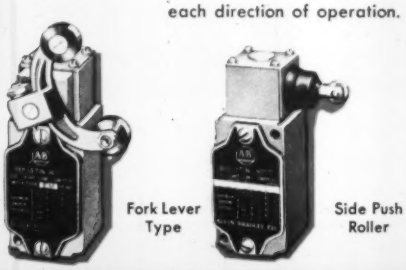
Allen-Bradley Bulletin 800T oiltight limit switches on typical life tests have run many millions of operations. Write for complete information on the Allen-Bradley line of quality limit switches for every industrial application.

Here are some new—and some old—Allen-Bradley oiltight limit switches—all built to give you extra millions of trouble free operations. Their switch bodies and operating heads are both sealed. Oil, dirt, and metal chips cannot enter and foul the contacts or cause sluggish operation of the momentary contact mechanism. Double break, silver alloy contacts never need maintenance. The snap action switch is positive insurance against any reduction of the contact pressure as the "trip point" is approached. This means less chance for chatter and arcing of relays, contactors, or starters operated by the limit switch—and prolonged trouble free contact life for the limit switch itself.



The Allen-Bradley line of limit switches is complete. Illustrated are only a few variations.

Neutral Position Momentary Contact Limit Switch. One set of contacts is closed for each direction of operation.



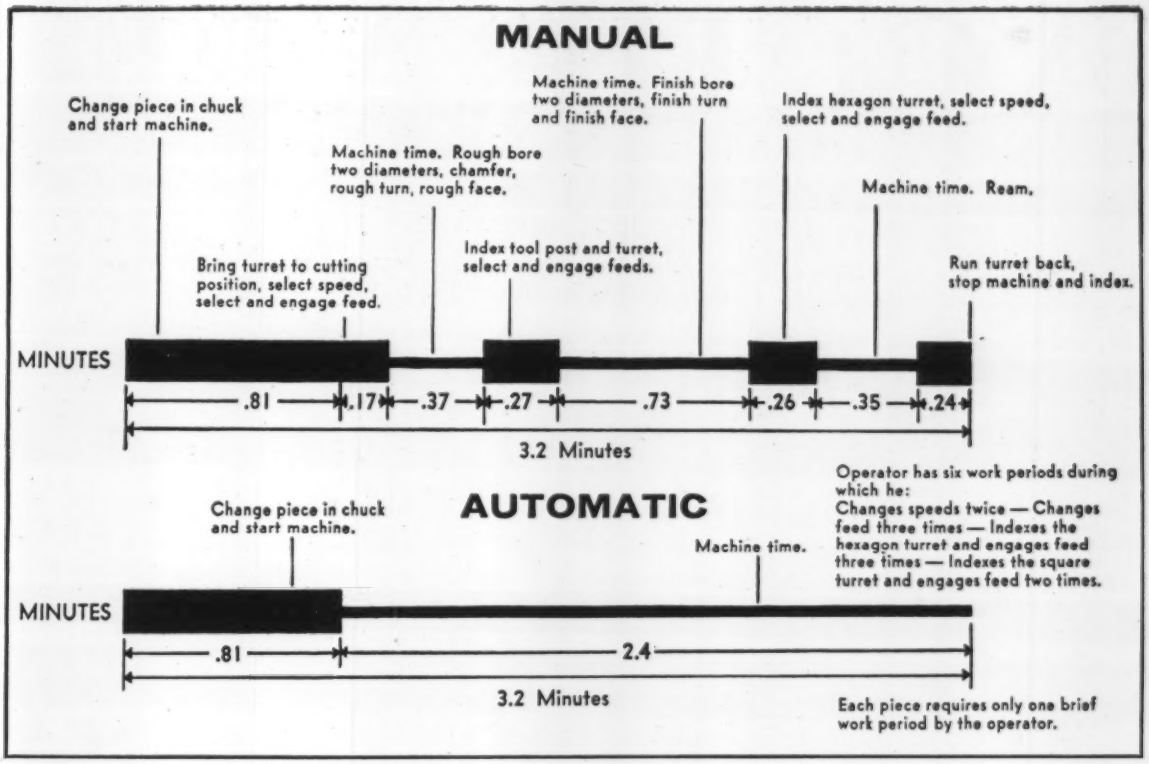
S-59-MB

ALLEN-BRADLEY

MOTOR CONTROL

QUALITY

Allen-Bradley Co., 1316 S. Second St., Milwaukee 4, Wis.
In Canada: Allen-Bradley Canada Ltd., Galt, Ont.


MANUAL
Change piece in chuck and start machine.
Machine time. Rough bore two diameters, chamfer, rough turn, rough face.
Bring turret to cutting position, select speed, select and engage feed.
Index tool post and turret, select and engage feeds.
Machine time. Finish bore two diameters, finish turn and finish face.
Index hexagon turret, select speed, select and engage feed.
Machine time. Ream.
Run turret back, stop machine and index.
MINUTES
.81
.17
.37
.27
.73
.26
.35
.24
3.2 Minutes
AUTOMATIC
Change piece in chuck and start machine.
Machine time.
Operator has six work periods during which he:
Changes speeds twice — Changes feed three times — Indexes the hexagon turret and engages feed three times — Indexes the square turret and engages feed two times.
MINUTES
.81
2.4
3.2 Minutes
Each piece requires only one brief work period by the operator.

How the new Gisholt Fastermatic makes you

MORE MONEY DURING MACHINING TIME

Drastic reduction of operator time in machine handling —that's the story behind the success of the new Gisholt Fastermatic Automatic Turret Lathe.

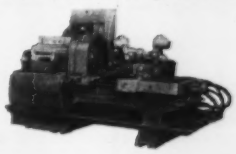
Evidence? Look at the chart above. *Compare* the time and work cycle of a manually operated turret lathe with a Gisholt Fastermatic—*on the same job.*

The piece, a wheel hub, is rough-bored, finish-bored, reamed, rough-faced, finish-faced and chamfered. Both cross slides and three hexagon turret faces of the Fastermatic are used. Identical tooling on the other three hexagon turret faces permits finishing two parts with each complete index of the turret.

The contrast is startling. The manually operated machine takes over 54% of the operator's time...the Fastermatic takes only 25%! The operator's "free time" is doubled—giving him ample time to keep another Fastermatic under cut on a similar operation *and also* inspect and stack finished parts or perform other work.

You may have jobs where the new Fastermatic can show even greater savings. Let Gisholt help you find out —mail the coupon now.

A COMPLETELY NEW MACHINE. New selector-switch control panel on Gisholt Fastermatic reduces setup time 50% or more. Operator simply chucks piece, starts automatic cycle, removes completed part. Human error is eliminated. Operator is free during machine cycle to handle additional units or to do other work. New Fastermatic is quick and easy to set up; no cams to change. Ideally suited for long- or short-run operations. Increased power, higher spindle speeds permit more efficient use of today's cutting tools. *Investigate now.*



GISHOLT MACHINE COMPANY

Madison 10, Wisconsin

ASK YOUR GISHOLT REPRESENTATIVE ABOUT FACTORY-REBUILT MACHINES WITH NEW-MACHINE GUARANTEE

Gisholt Machine Company
1217 E. Washington Ave.
Madison 10, Wisconsin

☐ Send new Fastermatic Catalog 1179-A.

☐ Have Gisholt Representative call.

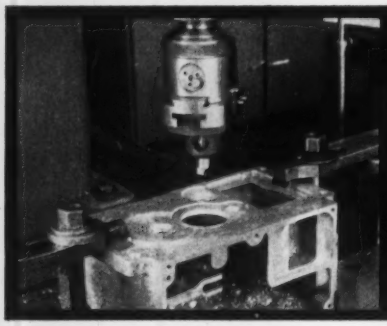
Name..... *Title*.....

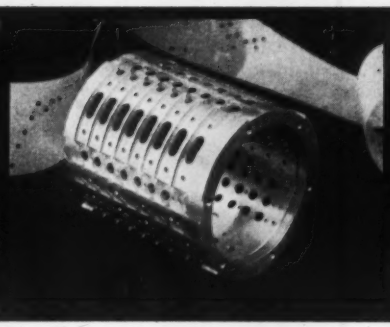
Company.....

Street Address.....

City..... *State*.....

ACCURACY





MACHINING TIME WAS CUT 50% for 10-piece lots of these gear boxes, by changing from manual to tape control. Locations made automatically under tape control are accurate to .0001".

30-HOUR JOB DONE IN 7½, when this precision computer part was machined under Numerical Control. This job involved precision machining at 566 separate locations.

1429 HOLES WITHOUT ERROR, an almost impossible job under manual operation, was completed under Pratt & Whitney Numerical Control with estimated time savings of 41%.

ASSURED...

"P&W NUMERICAL CONTROL HAS PROVED IT WILL IMPROVE **MACHINE UTILIZATION*** 100% AND ELIMINATE ERRORS," says "Jake" Jaeger

**(Time spent cutting metal)*

Mr. J. J. ("Jake") Jaeger, Vice President and Chief Engineer of Pratt & Whitney's Machine Tool Division, states, "Reports from more than 35 successful installations in the field and experience in our own manufacturing conclusively prove that P&W Jig Borers with Numerical Control represent a truly significant advance in metalworking. Users, which include both the giant corporations and shops with less than 10 men, are realizing time savings from 2-to-1 to 6-to-1 – depending on the complexity of the parts – and in addition have improved their MACHINE UTILIZATION time 100%. With this great increase in productivity, the jig borer has truly become a production machine. Used, for example, in our own manufacturing of components, the need for expensive jigs is eliminated, engineering changes are simple and inexpensive – and every production part has the toolroom precision of an original jig.

ADDITIONAL ECONOMIES THROUGH SCRAP ELIMINATION . . .

"With all machine positioning made automatically under Numerical Control, scrap losses from human errors in positioning are eliminated. Freed from blueprint calculating, the operator can concentrate on his primary job – making chips. The result is more and better work, with less fatigue.

VERSATILITY UNLIMITED

"The P&W Jig Borer has also proved that it can handle efficiently and economically an almost unlimited variety of jobs – one-piece jobs, extremely complex jobs, or lot production – in fact, any job that requires drilling, reaming, tapping or boring holes, or milling slots or surfaces."

Summing up the importance of Numerical Control, "Jake" Jaeger continues, "No one can *afford* to overlook the ability of this equipment to increase machine tool utilization and effect economies in his own operations." Experience has proved the truth of this statement, so act today to get all the facts on P&W Numerical Control. Write now for your free copy of Circular No. 609. Pratt & Whitney Company, Inc., 13 Charter Oak Boulevard, West Hartford, Conn.

PRATT & WHITNEY

FIRST CHOICE FOR ACCURACY

MACHINE TOOLS • GAGES • CUTTING TOOLS

AUTOMATICALLY POSITIONING WORK ACCURATE TO .0001", the P&W Numerically Controlled Jig Borer combines toolroom precision with production-line speed and economy.

SETTINGS ACCURATE TO 5 SECONDS OF ARC are made automatically by the P&W Rotary Table with Numerical Control. Automatic positioning speeds work, eliminates human errors.

PROFILE MILLING ENTIRELY UNDER TAPE CONTROL, the P&W Numeric-Keller produces irregular shapes without the need for any template or model. Accuracy is unusually high.

Here's the PRACTICAL* approach

POTTER & JOHNSTON

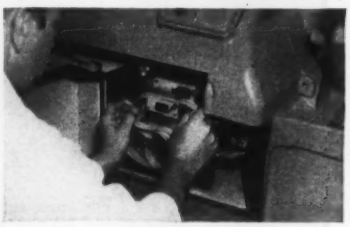
*SIMPLE . . . to understand, operate and maintain.

*LOW COST . . . priced far below other tape control systems.

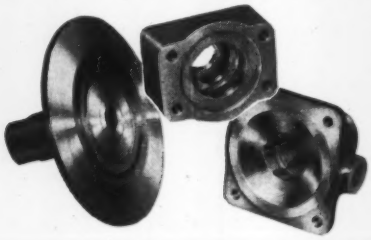
*SAVES TIME . . . as much as 25%.

PREPARING THE INITIAL TAPE TAKES LESS THAN 30 MINUTES . . . for the average job, and preparation is readily handled by any clerical or other non-technical employee. Since the tape is easily stored for re-use, additional time is saved on every repeat run. Using a simple code table, a "program chart" is first prepared from the regular operation sheet. No mathematical computations or conversions are involved. Following the coded data on the program chart, the tape is then punched, using the compact tape preparation unit. This is equipped with easily set dials for moving the tape to the correct address points . . . and clearly marked buttons that are pressed to punch all necessary machine commands into the tape.

ALL PROGRAMMING SETUP TIME IS ELIMINATED . . . by simply placing the tape in the machine's tape reader —which takes only a couple of minutes. Unusually compact, the controls are installed as part of the machine and occupy no additional floor space.



PARTS ARE COMPLETED IN MINIMUM TIME . . . under tape control, because the entire machining cycle is programmed by the Engineering Department instead of the setup man. As a result, machine spends *more* time cutting metal, *less* time "cutting air."

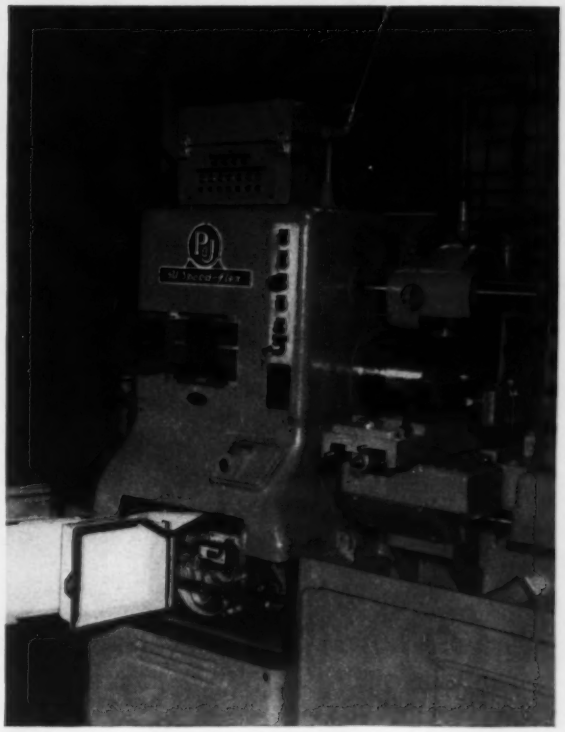


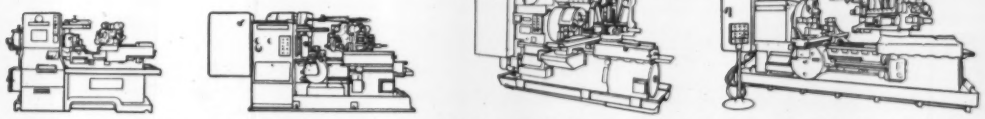
to Automatic Machine Programming

TAPE CONTROL

Potter & Johnston Tape Control is a unique new type of control system that makes the advantages of automatic programming available on a practical, economically realistic basis. The very low initial cost of $3,500.00 is possible, because of its simplicity. It is not electronic, and therefore requires no tubes or transistors. Unlike other systems, P&J Tape Control can be easily added to current models of Potter & Johnston Automatics already in the field, in addition to being available on new machines.

Operating under the P&J Tape Control System, all motions of the machine's spindle, turret and cross slides—including all speed and feed changes—are controlled by a quickly prepared plastic tape. As a result of the increased efficiency made possible by this system, a manufacturer using a P&J Tape Controlled Automatic in regular production has already reported savings of 25% in machining and setup time. In addition, the cost-cutting benefits of automatic machining are now made available for many production runs involving 25 pieces or less.





. . . . AUTOMATIC TURRET LATHES WITH CHUCK SIZES FROM 6 INCHES TO 42 INCHES . . . .

POTTER & JOHNSTON

SUBSIDIARY OF PRATT & WHITNEY COMPANY, INC.

PRECISION PRODUCTION TOOLING SINCE 1898

YOU'LL FIND ALL THE TIME-SAVING FACTS . . .

on P&J Tape Control in this new circular. Use the coupon here to send for your free copy. See for yourself how this unique system can provide the practical, simple answer to your profit-building, cost-cutting requirements. Potter & Johnston Company, Pawtucket, Rhode Island

POTTER & JOHNSTON Company, Pawtucket, R. I.

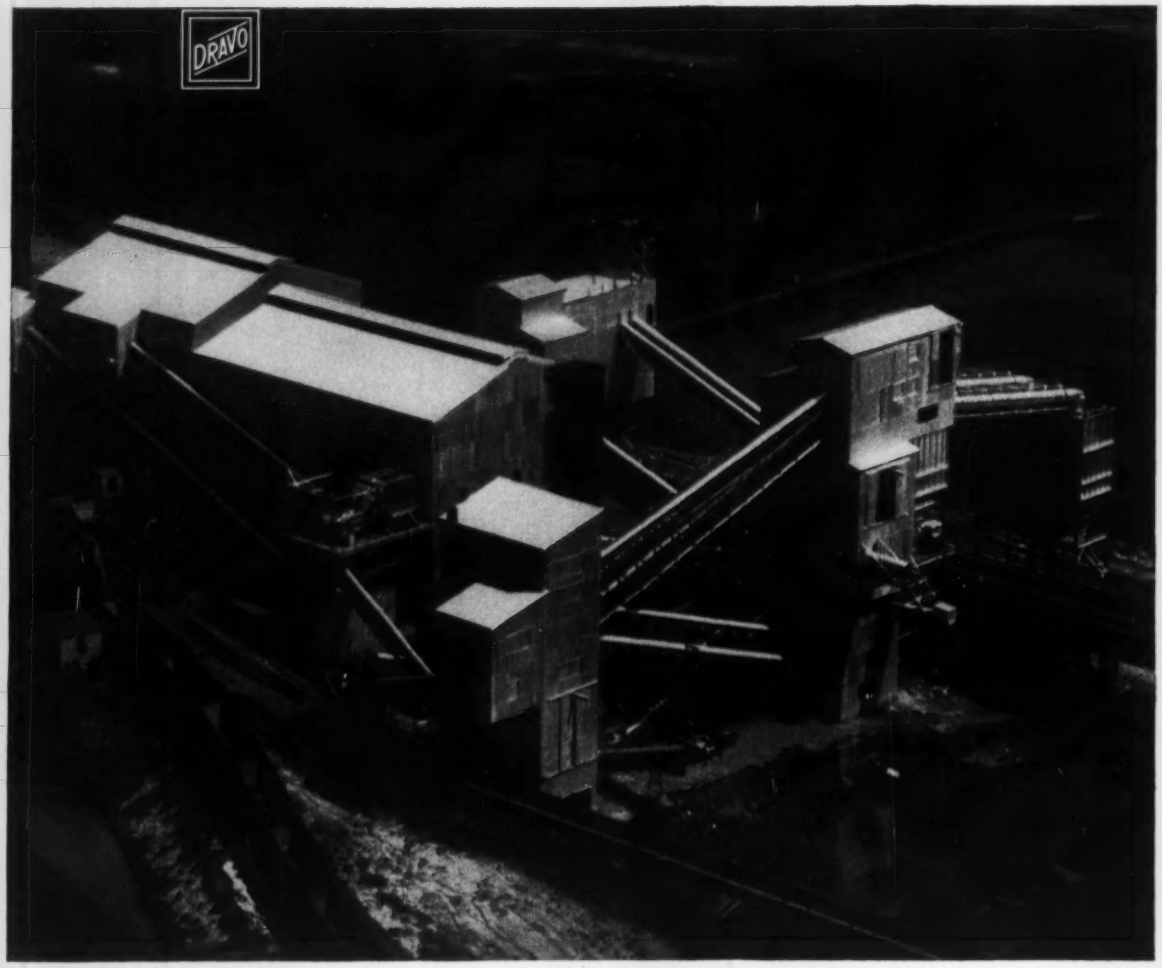
Please send my free copy of Bulletin No. 176 fully describing P&J Tape Control for Automatic Turret Lathes.

NAME_____ POSITION_____

COMPANY_____

CO. ADDRESS_____

CITY_____ ZONE_____ STATE_____



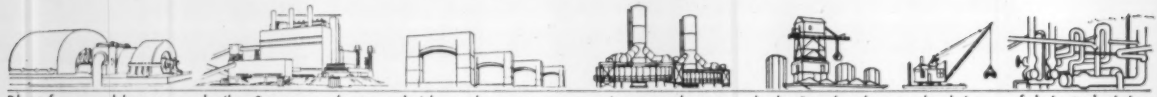
New Dravo-Lurgi Sinter Plant for Armco Steel

This Armco Steel Corporation installation at Ashland, Ky., is the first of several Dravo-Lurgi sinter plants to be completed. The new facility will make it possible to reclaim accumulated sludge and flue dust, increase the efficiency of blast furnace operation.

Built into extremely limited space, the plant receives and stores a day's supply of raw materials in eight hours. It then sinters twenty-four hundred tons per day for blast furnace charging.

The Armco facility is one of four new Dravo installations, two of which have capacity greater than any plant in the United States. For information on sintering equipment or the other products and services listed below, write DRAVO CORPORATION, PITTSBURGH 25, PA.

DRAVO
CORPORATION



Blast furnace blowers • boiler & power plants • bridge sub-structures • sinter coolers • docks & unloaders • dredging • fabricated piping

foundations • gantry & floating cranes • gas & oil pumping stations • locks and dams • ore & coal bridges • process equipment • pumphouses & intakes

river sand and gravel • sintering plants • slopes, shafts, tunnels • space heaters • steel grating • towboats, barges, river transportation

50 years of experience at Central Steel & Wire Company give warehouse service new dimensions

PLANTS AND OFFICES

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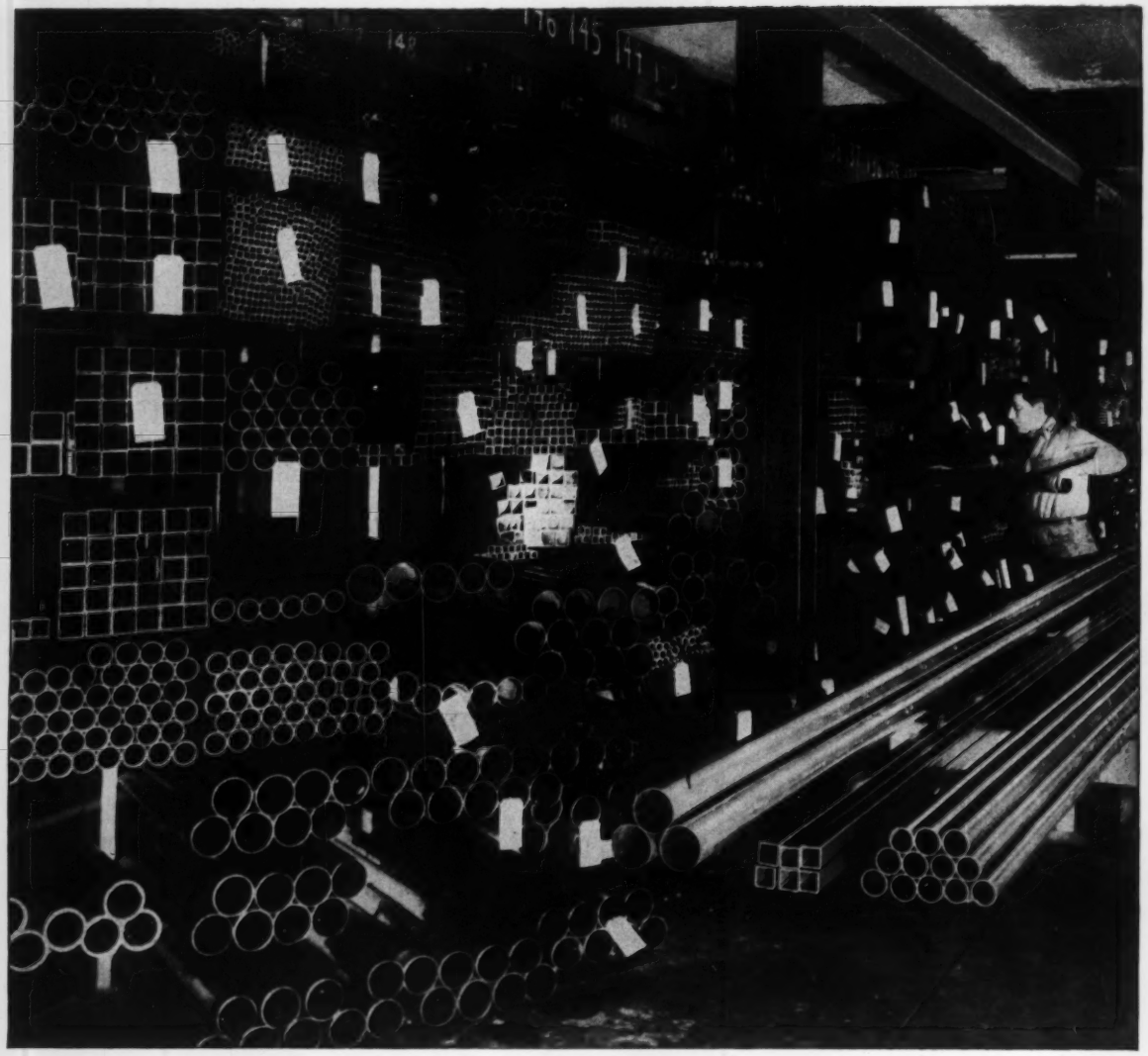
DETROIT 12, MICH. P.O. Box 148 Hamtramck Sta., TWinbrook 2-3200
CINCINNATI 14, OHIO P.O. Box 148 Annex Sta., AVon 1-2230
MILWAUKEE 1, WIS. P.O. Box 1154, HUmboldt 1-5000



The type of tubing you need is here

It pays to analyze your tubing requirements with a Ryerson tubing specialist. He is well qualified to help you select the right tubing for your purpose from Ryerson's diversified stocks.

The Ryerson specialist knows tubing—knows what will work best and why. In many cases, he can recommend a type that will do a better job for you—perhaps a newer type that will save you money, either in first cost or in the cost of using it.

Ryerson carries the nation's largest stocks of steel tubing—all of certified quality—and uses the finest modern equipment to cut to your exact specifications. And Ryerson delivers fast—one tube or a thousand.

The Ryerson tubing specialist is as close as your telephone. Give him a call today.

RYERSON CERTIFIED QUALITY

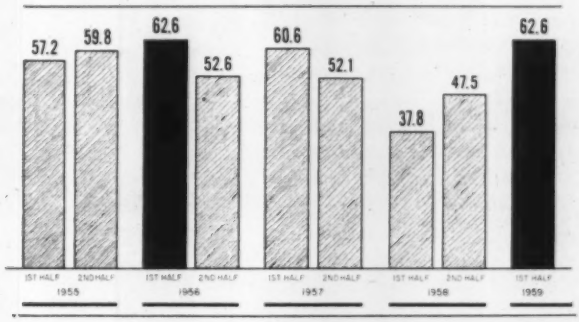
RYERSON STEEL®

Member of the INLAND Steel Family

Tubing in stock: Seamless and welded mechanical tubing; fluid line, pump cylinder and structural tubing; stainless pipe and tubing; PVC pipe and fittings. Also, aluminum tubing in many plants.

PLANTS AT: NEW YORK • BOSTON • WALLINGFORD • PHILADELPHIA • CHARLOTTE • CINCINNATI • CLEVELAND • DETROIT • PITTSBURGH
BUFFALO • INDIANAPOLIS • CHICAGO • MILWAUKEE • ST. LOUIS • DALLAS • HOUSTON • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE

Record Breaking Half in Prospect?



A new peak in steel ingot production is possible this half. We'll have to hump to surpass the record (62.6 million tons) set in 1956's first half (also a period with a strike threat hanging over it), but many steelmen think it can be done (Page 45).

Bellwether Continues Strong Advance

Production of screw machine products—one of metalworking's most sensitive bellwethers—is continuing the sharp upturn which began in the fourth quarter and should reach a peak for 1959 in April, says the National Screw Machine Products Association. New orders jumped from 179 per cent of the 1946-49 base period in December to a preliminary 193 in January, and shipments advanced from 175 to 187. The shipment index will advance to a point between 190 and 200, then taper off, with the whole year averaging better than 1958 but no better than 1957.

And the Smog Rolled on

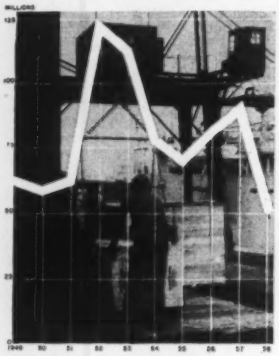
Residents of Los Angeles have turned watery, smog-reddened eyes toward Detroit in the latest attempt to wipe out L. A.'s plague (Page 48). Mayor Richard Paulson now vows to clear the air by purging automotive exhaust fumes, even if he has to force owners to equip their cars with afterburners. Detroit answers that the scheme is impractical, expensive. Converters might cost $200 each.

Ford, AMC Sales Up in February

American Motors Corp. reports sales for the first ten days of February at 6945 units, 139 per cent above the year-ago pace and 50 per cent ahead of the same period in January. In the first four months of AMC's fiscal year, Rambler deliveries are 147 per cent ahead of the comparable year-ago mark. Ford Div., Ford Motor Co., says sales in the first ten days of February

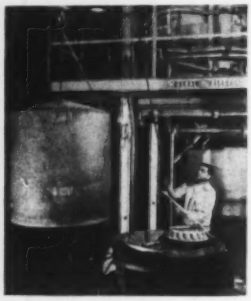
are 6 per cent ahead of its performance in the same January period; 55 per cent greater than the pace in the first ten days of February, 1958.

Machine Builder Favors Scrapping Tariffs



"Tariffs should be scrapped because they endanger the world's economy," warns H. G. Bixby, president, Ex-Cell-O Corp., Detroit, machine and cutting tool firm. Mr. Bixby believes unrealistic trade barriers and unequal wage costs in terms of productivity are pushing this nation right out of world competition. The pattern in U. S. machine tool exports (right) tells what's happening. American firms face stiffer competition from European Common Market members; other common markets are in the works. Mr. Bixby also recommends intelligent trading with Communist nations. It's only a matter of time before they will be exporting elaborate machines. With no competitive enterprise, they can price equipment to meet their political goals (Page 60).

Brazing Rises with Missile Industry



Brazers are expecting a 10 to 20 per cent surge in their processing business this year as the tempo steps up throughout metalworking. (The industry held its ground during the recession.) Besides winning converts to this type of joining, the industry looks for growing applications in the high temperature rocket, missile, and space fields. Says A. R. Ryan, manager of process and industry market development, Industrial Heating Dept., General Electric Co., Shelbyville, Ind.: Brazing will become increasingly important in missilemaking, particularly in the area of big, liquid fueled engines (Page 52).

Missiles: Squabble on Emphasis Goes on

Look for Congress to vote an additional $700 million for fiscal 1960's defense budget to close the "missile gap." That's enough to build seven more squadrons of Atlas ICBMs. For 1961-63, Democratic sources say Pentagon will ask for enough to build another 20 squadrons of Atlas or Titan missiles before Minuteman production takes over. Things aren't so smooth with the Army's Nike Zeus program. The Army says it's at the production stage. Defense Department scientific advisers disagree. It looks like the potential $5 billion program may get stalled, although Pentagon Comptroller Wilfred McNeil says "nothing will be spared on the development." Navy officials feel they aren't getting a fair shake with their Polaris program, either. The first solid fuel missile will be operational within a year, but Navy researchers feel they haven't received the "favored treatment" the Pentagon has given other weapon systems. It isn't being pushed at an "optimum rate," they charge.

Defense Obligations for Procurement, R&D To Rise

Last minute buying decisions for fiscal 1959 will swell obligations (new orders, not spending) for defense procurement and R&D during the first half, says Wilfred McNeil, Pentagon comptroller. The total will slide to $8.6 billion during the second half, then rise again to $10.5 billion in the first half of calendar 1960. But metalworkers should note that over-all defense spending, which has held steady at a quarterly rate of $10.3 billion since the last half of 1958, will continue at that level for at least another six quarters.

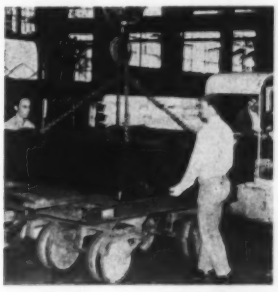
Nickel Sulfamate Provides a Stressfree Plate

You'll find barrel plating, with a nickel sulfamate bath, just right for finishing small, odd-shaped parts. It leaves an attractive, stressfree deposit that won't peel, even when the base material is bent double after plating. The process brought production costs down and did such a good plating job on typewriter type bars, that it's now used to finish a variety of internal parts for business machines (Page 98).

Featherbedding Fight May Mean Strike

Metalworking executives are watching the new fight over featherbedding in the railroad industry because of the threat it poses to distribution later this year. Both management and union leadership in this vital industry are taking stands that could lead to a major rail strike when the present labor contract expires on Oct. 31. Management wants a special Presidential commission to work out a solution to the problem. Labor leaders say no soap; there is no problem to be solved (Page 49).

Cost Cutting on the Hoof Saves $178,000 a Year



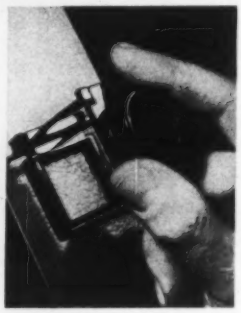
Is the handling of your work in process costing too much in time and manpower? Take a tip (Page 84) from Union Carbide Corp.'s National Carbon Co., Clarksburg, W. Va., where the switch to pallet handling of parts started a chain reaction of cost savings. Annual savings are $178,000—the return on a $74,000 investment in the pallet system. Thirty men were freed for production work.

Du Pont Introduces Plastic for Diecasting

A new plastic called Delrin may make your diecastings cheaper. Auto carburetors made of the material have lasted the life of the car. Du Pont

claims finished parts will be cheaper than their metal counterparts because holes and finished surfaces can be cast, eliminating machining. The plastic comes in some 60 colors (at a premium). Production is slated for June in a new plant at Parkersburg, W. Va.

Pittsburgh Steel Offers 48 in. Patterned Sheets



Pittsburgh Steel Co. is producing patterned sheets 48 in. wide—about twice the width previously available. The steel has a leatherlike finish and is being used in Westinghouse Electric Corp. appliances and in some 1959 auto interiors. Building applications are among other potential uses for the wider sheets. The material is available in a variety of gages and widths, in cut lengths or coils. As flat, drawable, and formable as plain sheets, pattern-rolled can be run interchangeably through all Westinghouse production sequences without any special or additional setups or changes. Once formed, the shell for a washer or dryer is Bonderized, then sprayed with a coat of wood toned enamel.

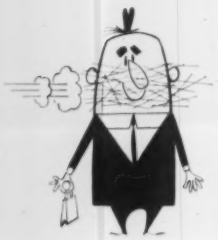
Water Use To Double by 1975

By 1975, the nation's water requirements will hit 450 billion to 500 billion gallons a day—more than twice current needs, predicts W. A. Dexheimer of the Bureau of Reclamation. Mr. Dexheimer says that $115 million in reclamation contracts will be awarded this year; another $4.8 million will be available as loans to irrigation districts for smaller building projects.

Engineering Enrollments Fall

Engineering school enrollment is dipping for the first time in seven years. Industry will start to feel the pinch in 1960. The 153 accredited U. S. engineering colleges had 2.9 per cent fewer students in the fall of 1958 than in the year-ago period; freshman enrollment was 59,164, a drop of 11.6 per cent. Enrollment is lower through the second and third year levels, but fourth and fifth year classes remain about the same. This means more graduates in June, 1959; fewer in following years.

Straws in the Wind



Custom copper smelters bumped prices 0.5 cent to 30.5 cents a pound, the highest they've been since June, 1957. Now selling at 0.5 cent a pound over primary producers, they expect brisk demand while the metal remains in tight supply . . . Chrysler Corp. reports 1958 sales of $2.16 billion, a net loss of $34 million (in profits) for the year . . . General Electric Co. will protest the award of a TVA contract to a British electrical firm for building a 500,000 kw steam turbine generator. The Britons underbid GE, low domestic bidder, by $5.5 million . . . GMC Truck & Coach Div., Pontiac, Mich., has a new line of transit buses with picture windows, greater heating capacity, optional air conditioning.

Here's a MARVEL HIGH-SPEED-EDGE Hack Saw Blade we wouldn't sell you!

This blade **could** have been packaged and shipped as a genuine MARVEL High-Speed-Edge Blade . . . and it **might** have performed to a customer's satisfaction. Instead, it was rejected and will be scrapped because inspection revealed a minute imperfection.

There's nothing unusual about this. Certainly, other hack saw blade manufacturers inspect their products, and undoubtedly reject blades for one reason or other, because they are trying to market the best blades they know how to make.

And that's the point—here at MARVEL, where the composite blade was invented and perfected over 30 years ago, we believe we know more about making high-speed-edge hack saw blades than any other maker. We've been at it longer, and the unequalled performance of MARVEL Blades on every kind of material is evidence that we're right.

Use MARVEL Blades on your power hack saws with perfect confidence that they have no equal. You can get MARVEL Blades at your nearby Industrial Distributor.

Write for the new MARVEL Cutting Tool Bulletin.

B-1122

MARVEL Metal Cutting SAWS
Better Machines—Better Blades

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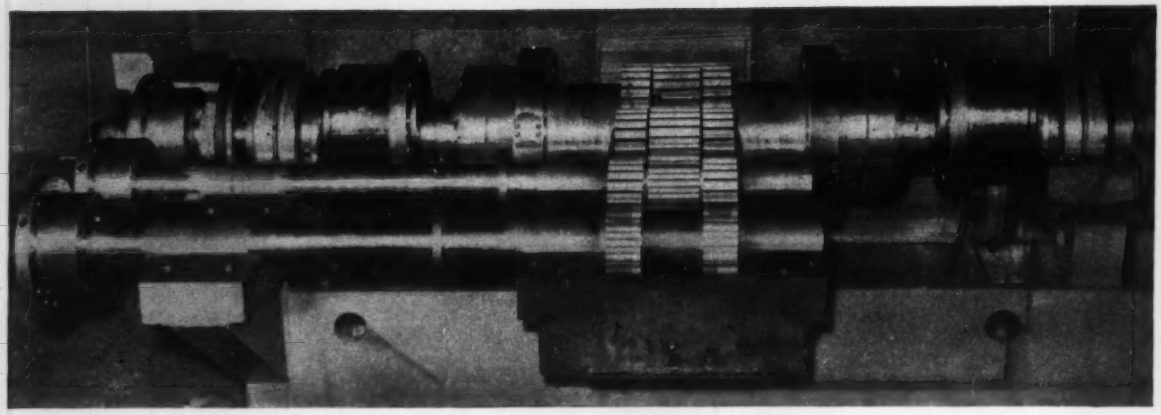


Assembled main shear shaft and front gate drive shaft used in model 541 guillotine flying shear. Shafts range up to 9¼" in diameter and 16' in length. All shafts are fabricated of type 4340 nickel alloy steel.

Giant "flying" shears need...

Nickel alloy steel for fatigue strength and shock resistance in heavy shafting

Cutting metal strip is a shaft breaking job!

It takes enormous blade pressures applied as much as 180 times a minute 250,000 times a day. That's rough on the shafting that activates the shears.

How does The Hallden Machine Company design shafting to take this kind of punishment?

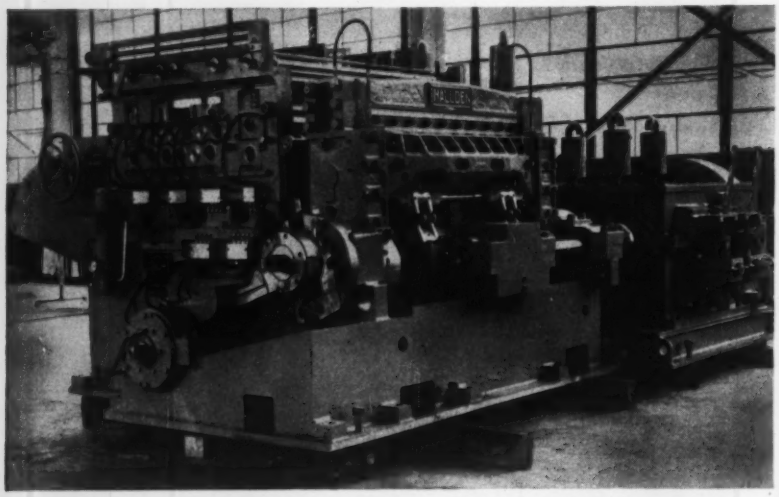
They do it with 4340 nickel-chrome-moly steel.

Some shafts are as large as 9¼ inches in diameter. But even in these heavy sections, 4340's good response to heat treatment provides the toughness and fatigue resistance needed.

For these reasons, type 4340 is now standard for bull . . . main shear and drive box shafting and all other heavy-duty shafting. The extra stamina it delivers pays off for Hallden customers in long, dependable service.

Do you have a difficult or new design problem that demands a material with special properties? If so, you might find exactly what you need in one of the standard grades of nickel alloy steel.

The booklet "The Properties of Heat Treated Wrought Nickel Alloy Steels" helps you choose the right steel for the job. It gives you useful information on the many different nickel alloy steels and describes their range of properties. Heat treatment methods . . . for both carburizing and direct hardening steels . . . is explained in detail. Ask for a copy of this helpful bulletin. We'll be glad to send it to you.



Hallden guillotine flying shear. Nickel-chrome-moly steel, heat treated to a nominal hardness of 260 Brinell and tensile strength of 125,000 pounds per square inch provides the properties needed for heavy-duty shafting in shearing machines. Built by The Hallden Machine Co., Thomaston, Conn.

The INTERNATIONAL NICKEL COMPANY, Inc.
67 Wall St. New York 5, N. Y.

INCO
TRADE MARK

INCO NICKEL

NICKEL ALLOYS PERFORM BETTER, LONGER

Dear Mr. McDonald:

Why a Steel Strike?

Almost everyone expects that you will pull members of your steelworkers union off their jobs when your present three-year contract with the steel industry expires June 30.

The minority thinks you will borrow a leaf from the book of your intramural competitor, Walter Reuther, and ask your men to work without a contract until consumers get low on steel.

But, whatever the timing, the odds still favor a strike lasting four to nine weeks.

That is because most people think steel industry management cannot be expected to come across with your $1 billion package (50 cents an hour) that calls for increased pensions and insurance, longer vacations, more holidays, more unemployment compensation, and larger shift premiums.

As a basic industry, steel is under compulsion to help hold the wage-price line as a means of averting inflation. It cannot grant increases in wages that exceed increases in productivity without raising prices.

Because of the wage-price spiral, steel and the products made from steel are already losing out in world markets. Here at home the St. Lawrence Seaway will provide still easier access for foreign steel to the heart of the American market.

Mr. McDonald, you need to help strengthen, rather than tear down, the position of the industry on which your million and a quarter members depend for their livelihood.

A long steel strike would deliver a lethal blow to the recovery in business that has not been felt fully by the automobile industry and hardly at all by the capital equipment industry. It would disrupt the government's fiscal planning. It would increase unemployment, now numbering nearly 5 million. The prospect of a strike has already forced consumers to rush in for material they will not use for months.

Why not demonstrate true labor statesmanship by asking for a contract with adjustments that are reasonable and fair?

Really, Mr. McDonald, why is a steel strike necessary?

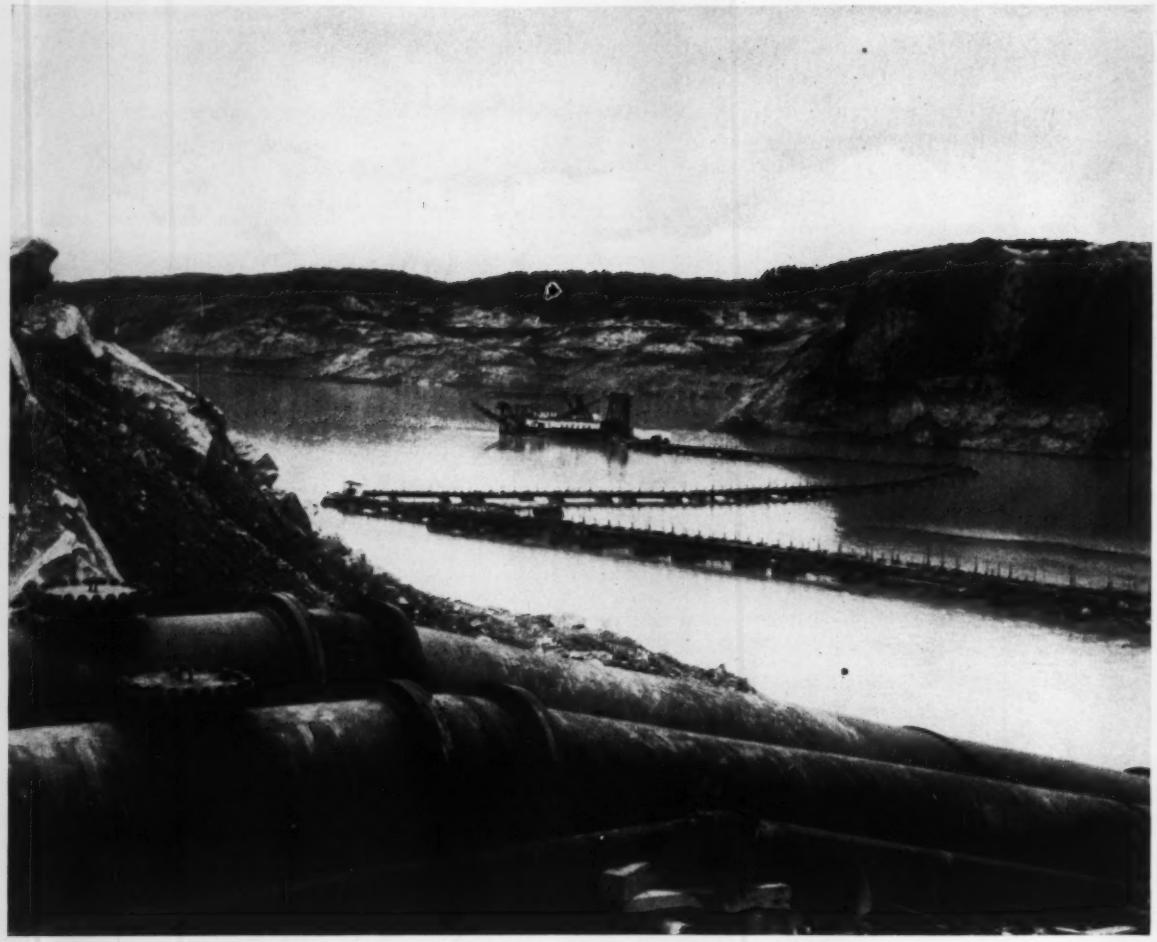
Irwin H. Such

EDITOR-IN-CHIEF

THE BIG SIP!

Twenty-four hours per day—for 35,000 continuous hours since 1955—enormous steel straws have been drinking up and re-filling an ancient ice-age lake. It's happening at Atikokan, Ontario, where beneath millions of tons of glacial silt at the bottom of Steep Rock Lake, a vast treasure trove of iron ore has been found. In the Spring of 1960, when the last of the silt has been removed and the lake emptied for the last time, mining will begin. At peak operation the new mine will furnish 3 million tons of ore a year to Inland's blast furnaces. This is another giant step in Inland's long-range expansion program to meet the growing needs of industrial Mid-America, now and in the future.

building today, with an eye to tomorrow



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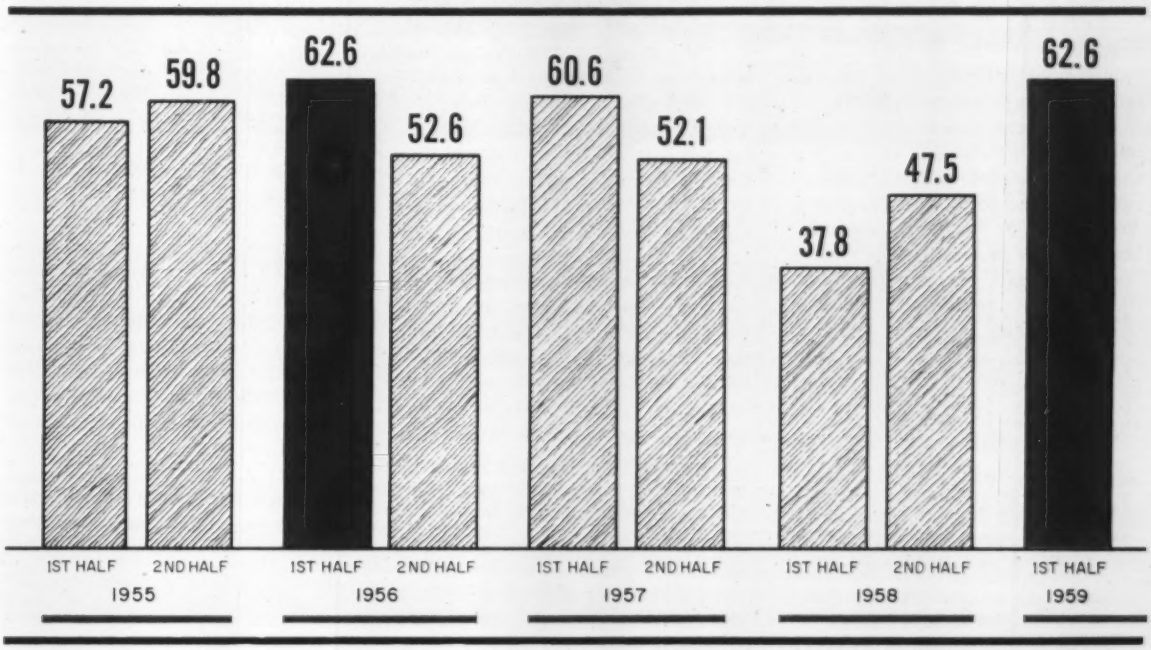
Can 1959's First Half Steel Ingot Output Surpass Record Period?



STEEL production in the first half can break the six-month record (62,607,172 net tons) established in strike-plagued 1956.

Bulging demand brightens the short term outlook as consumers rebuild depleted inventories and protect themselves against possible shortages if we have steel labor trouble at midyear.

During the first two months of this year, furnaces will pour an estimated 18,763,000 net tons, equal to 78.6 per cent operations (based on annual ingot capacity of 147,633,670 net tons). In the like two months of 1956, more than 20,947,000 tons were poured, with operations averaging 99 per cent. (Capacity was 128,363,090 tons.)

• **Weekly Record Near**—The weekly output record of 2,525,000 net tons, set in the week ended Dec. 17, 1956, will soon be broken. To do so, the industry will have to operate at 90 per cent of capacity, only 4 points above last week's rate.

If the industry is to set a six-month production record in the first half, it'll have to operate at an average of 89 per cent from March through June. That's because January-February output was off the record pace of early 1956, when strike-hedge buying also figured.

• **No Sinecure**—Catching up won't be easy, even though current ingot capacity is 15 per cent greater than that in 1956 and the pressure of strike-hedge demand is as strong as it was then. Industry authorities (some of whom are predicting first half output of around 60 million tons), say they'll have to fight hard to get production up to the early 1956 pace because:

1. Operating conditions differ from those prevailing at this season in 1956. At that time, high level production had received momentum from the fast pace that had prevailed throughout 1955 (see chart). In each of the first five months of 1956, output exceeded 10 million tons, ranging from 10.8 million in January to 10.4 million in May. This year, however, production is being pulled up from the recession lows of 1957-58. After varying periods of layoffs, work forces are rusty; mill crews must be familiarized with schedules and equipment before sustained operations can be assured.

2. Demand in early 1956 spread over the complete range of products, being fairly well balanced between heavy and light items. Today, the product mix is unbalanced, running stronger in the lighter items (sheets and strip) than in the heavier plates, structurals, and tubular goods. This makes for imbalance in finishing operations, which, in turn, affects ingot production.

3. Some consumers, notably the large auto companies, are still buying conservatively.

4. June production possibly may

fall off the fast pace set in March-April-May because of wildcat walkouts and slowdowns as the strike deadline nears. That happened in 1956—June output dropped below 10 million tons for the first time since the preceding September.

• **Provides Drive**—Rising demand for the heavy products, notably plates and tubular goods, may correct the finishing imbalance in the product mix before too long. The seasonal spurt in structural steel requirements will also help to push production up before midyear.

The current bulge in demand reflects, to considerable degree, the shift from inventory liquidation to inventory building, says Marcus J. Aurelius, U. S. Steel Corp.'s administrative vice president.

He predicts that ingot output in the first six months will approach 60 million tons, up more than 55 per cent from the 37,757,007 tons produced in the like 1958 period. He forecasts 1959 production at 105 million to 115 million tons.

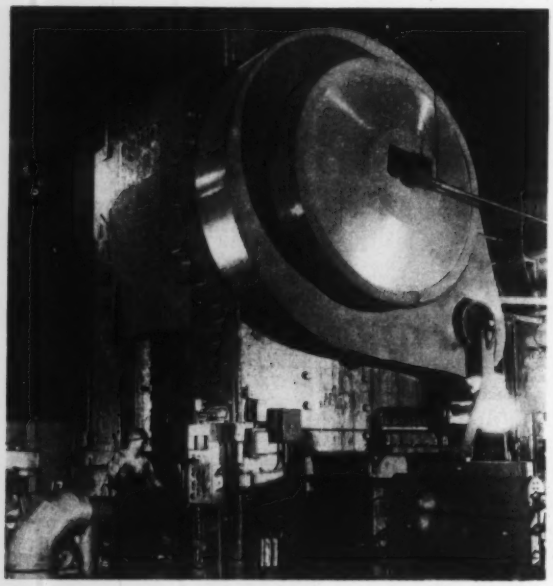
• **Might Do Better**—He concedes that output in the first six months could exceed his expectations should the economic recovery "go even faster" than he figures. Output will be on the high side of his predicted range for the year if new cars catch the public's fancy.

January's 9,312,000 tons was the highest output for any month since mid-1957 (see Page 118). Production in February, despite fewer days, should be equally as large. Indicated output last week (ended Feb. 22) was 2,439,000 tons, the best since the week ended March 3, 1957, when 2,456,000 tons were poured.

Production last month was the largest in 19 months. It was 600,000 tons greater than in December and 2.5 million tons above that in January, 1958. The most recent month with a higher total was June, 1957, when the furnaces produced 9,391,402 net tons.

• **Watch Oxygen Melting** — The American Iron & Steel Institute's monthly statistical report in January segregated production of steel by the basic oxygen process for the first time. This recognizes the growing importance of the process. Oxygen steelmaking capacity this year stands at 4,033,160 net tons; a gain of 4 million tons by 1960 is anticipated.

In January, 187,000 net tons of basic oxygen steel were produced. Comparisons: 120,000 tons of bessemer steel, 8,281,000 tons of open hearth steel, and 724,000 tons of electric furnace steel.



CRANKSHAFTS ARE KNOCKED OUT at a rate of 150 an hour on this 6000 ton hot forge press at General Motors Corp.'s Oldsmobile Div. forge plant, Lansing, Mich. Two presses replace a battery of steam hammers. Crankshafts are forged from 4 in. square billets of SAE 1046 or 1145 modified steel

GM Develops New Alloy

A material that sounds like a cross between forging steel and malleable iron has been developed by General Motors' Central Foundry Div. in co-operation with the corporation's research laboratories. Called CentraSteel, the metal may be a relacement for plain steel forgings and permit more flexibility in designing castings, declares W. B. Larson of the research lab.

Basic composition includes 1.70 carbon, 2.25 silicon, 0.40 manganese, 0.10 sulfur, 0.05 phosphorus, and 0.01 boron. It has high silicon, but low carbon content which gives it a 28 million psi elastic modulus. Strengths are equivalent to steel. Machinability and castability appear to be better.

Mr. Larson says CentraSteel introduces new concepts of foundry technology because it does not require extensive heat treatment, explosive or costly additives, injection apparatus or low maximum sulfur content.

Austin Has New Division

Austin Co., Cleveland, has established a Mining and Metals Div. for service to mining, concentrating, and primary metal producing and processing industries. Harry E. Eiber, Austin vice president, is general manager and Gordon Galloway is sales manager of the new division.

Aluminum Capacity Soars

India's capacity for the production of primary aluminum was more than doubled last week with the opening of a new smelter in Calcutta by Indian Aluminium Co. Ltd. The $10 million smelter has an annual capacity of 11,200 tons. It's part of a $30 million expansion project involving bauxite, alumina smelting, and aluminum fabrication.

Aluminium Ltd., Montreal, Que., has 61 per cent interest in the Indian company. The rest is held by 3000 Indian shareholders.

National Plans Chicago Mill

Nonintegrated steel facility between Gary and Michigan City, Ind., will get its basic metal from expanded Detroit furnaces. Weirton will also build as part of $300 million program

NATIONAL STEEL Corp., Pittsburgh, will spend $300 million on expansion during the next three years. Behind the move is the desire to stabilize its operations at Detroit and to move into expanding markets for tin plate, galvanized steel, and cold-rolled strip and sheets on a competitive basis. The program has three parts.

Midwest Steel

A new division called Midwest Steel Corp. has been formed to produce electrolytic tin plate, galvanized coils, hot and cold rolled sheets and strip. The nonintegrated facilities will be built between Gary and Michigan City, Ind. They'll include a tin plate line, galvanizing line, hot and cold rolled lines, plus supplementary equipment. Semifinished steel will be shipped by rail or water from Great Lakes Steel Corp., National's Detroit subsidiary.

Annual finishing capacity will be 480,000 tons. About 25 per cent will be tin plate, 10 per cent galvanized, and the rest in sheets and strip. Prime customers will be food processing industries in the Chicago area.

Equipment bids are being received; construction will start within six months. The facility is expected to be in operation by the end of 1961. Initially, it will employ 2200. Albert J. Berdis is president of Midwest Steel. He'll continue in his present job as president of Weirton Steel Corp., another National subsidiary, at Weirton, W. Va.

Great Lakes Steel

To provide semifinished steel for Midwest Steel, Great Lakes Steel will boost its ingot capacity 500,000 tons by rebuilding two, 250 ton, open hearth furnaces to 500 tons of capacity each and by installing oxygen lances on 14 of its 17 furnaces —the other three already have oxygen equipment. The capacity of one blast furnace at Zug Island will be increased. The projects will raise GLS's annual ingot capacity from 3.7 million to 4.2 million tons.

The company also will build an 80 in., 4-stand, continuous hot strip mill on a 70 acre plot about one-half mile from its present facilities at Ecorse, Mich. Paul H. Carnahan, GLS chairman, says five buildings covering 600,000 sq ft, will be built to house the mill and equipment. Construction will start immediately, and the mill should be in operation by June, 1964. The Detroit project will cost over $100 million.

The hot-strip mill will be able to turn out at least 250,000 tons of finished steel monthly, claims Wilfred D. MacDonnell, Great Lakes president. Only 70,000 tons a month will be shipped to Midwest Steel, which leaves an additional 180,000 tons for other customers. The company can stockpile up to 200,000 tons until Midwest Steel needs it.

Actually, Mr. Carnahan points out, when the 80 in. mill goes into operation, Great Lakes will probably close its 34 in. mill which has been in operation since 1929. The 80 in. job and its 96 in. mill will supply the company's finishing needs.

One reason for the expansion is to stabilize operations at Detroit so Great Lakes will be less dependent on the peaks and valleys of automobile output, says Mr. Carnahan. The company ships 82 per cent of its production to automotive customers. That's 9 to 10 per cent of all the steel used by the auto industry.

In dismal 1958, Great Lakes operated at an annual rate of 42 per cent of capacity, while the steel industry averaged 65 per cent. Now the company is running close to 100 per cent and is booked solid through June, says Mr. MacDonnell. Mr. Carnahan adds that the expansion will enable Great Lakes to meet rising steel requirements for automotive production which he anticipates will average 6.5 million cars annually over the next decade.

Weirton Steel

When Midwest Steel goes into operation, its lower freight rates will cause Weirton Steel to stop shipping finished steel into the Chicago area. Weirton will seek new markets in the East, around Pittsburgh, and the Ohio Valley.

To meet increased demand, Weirton is increasing its electrolytic tin plate capacity by installing two continuous annealing lines and two plating lines at its Steubenville, Ohio, plant. It also will expand its annealing and cold-rolled sheet facilities.

Sen. Paul Douglas (D., Ill.) says he'll push for a bill to block building the steel mill. He feels the Indiana dunes should be preserved as a place of beauty and recreation for the public. Immediately east of National Steel's property is the proposed Indiana port and just east of that is land owned by Bethlehem Steel Co. Farther east is the Indiana Dunes State Park area.

It's doubtful that the Douglas measure can get anywhere since Indiana is interested in more industry and in developing port facilities.

Carborundum To Build

Carborundum Co., Niagara Falls, N. Y., will build a $750,000 pilot plant for its Research & Development Div. in that city. Gen. C. F. Robinson, president, says nine months to a year will be required for construction of the building, procurement and installation of the equipment. The division is turning out new products which require ultrahigh temperature processing techniques not available in the main operating divisions of the company. New products being produced in a smaller pilot plant will be brought to full commercial status in the new pilot plant. Principal market for the products is in the atomic energy, missile, and electronic industries. The new pilot plant will be operated by the New Products Branch, Research & Development Div.

NEA

Residents of Los Angeles are looking for a way out of their smog dilemma

Los Angeles Smog Engulfs Major Detroit Automakers

THE AUTO INDUSTRY last week prepared to do battle anew with a ghostly enemy, the acrid smog that persistently invades and imperils Los Angeles.

An advisory group of industry brass, backed by the Automobile Manufacturers' Association, went west to sunny Sacramento to explain to the California legislature how it can help smogbound L. A.

It marked the opening of a major campaign in what Detroit previously regarded as minor skirmishing until Los Angeles' mayor, Richard Paulson, charged three months ago that auto exhausts were the prime remaining cause of smog. If necessary, he said, he would get laws passed requiring carbuilders to install exhaust control devices.

• **Counterattack**—But now, faced with this direct attack, the industry has demothballed two catalytic converters and one afterburner and deployed its task force under the command of Paul C. Ackerman, Chrysler Corp.'s engineering vice president.

A three-pronged program was outlined to California lawmakers by Charles Chayne, General Motors Corp.'s engineering vice president.

Phase one would involve setting up official inspection methods so all cars in the Los Angeles area could be regularly inspected for hydrocarbon emission.

Phase two would establish a preventive maintenance program for all vehicles to reduce exhaust fumes.

Phase three would involve installation of exhaust control devices. (Detroit still has to solve problems of excessive heat, odor, catalyst attrition, and cost.)

• **Strategy**—Field umpires, observing the war, suggest there are some gaps in Detroit's company front. Legislating car maintenance is much like legislating good morals, they claim. Besides, it takes a lot of time and money. Installing afterburners can be pretty expensive.

Victor G. Raviolo, special assistant to Ford Motor Co.'s engineering and research vice president, points out that exhaust control devices may cost anywhere from $100 to $200 per car. At $150 each, it would cost some $400 million to outfit all cars in the Los Angeles area. Mayor Paulson would have quite a time trying to force the owner of a ten year old relic worth $100 to install a $150 catalytic converter.

Adds Mr. Ackerman: "We should not forget that, in the history of Los Angeles smog, various other sources of pollutants have been pinpointed as major causes and various degrees of control have been applied. Yet smog still exists."

Heat Pumps Cut Costs

One of the world's largest air-source heat pumps is operating in the new $2.3 million Flick-Reedy Corp. plant at Bensenville, Ill.

Built by York Div., Borg-Warner Corp., the 1200 hp unit will take heat from outdoor air (even at sub-zero temperatures) for wintertime heating and will remove heat from interior air for summertime air conditioning.

Heat pumps function essentially the same as window-type air conditioning units. For heating, the system operates in reverse. Flick-Reedy's installation contains three 200-ton units.

Total cost of the installation was $540,000. "This compares with $500,000 cost for the conventional oil heat and mechanical cooling combination," says Frank Flick, F-R's president. "However, we expect our winter heating to cost $7200 for electricity, compared with an estimated $12,000 for oil in a conventional heating unit."

Recession Takes Toll Among Railroads

	Operating Revenues	Operating Expenses	Net Income	Rate of Return (per cent)	Employment	Total Payroll
1958†	$9,564,075,782	$7,543,878,732	$602,000,000	2.76	840,100	$4,880,000,000
1957	10,506,244,265	8,237,720,185	740,000,000	3.36	986,001	5,358,043,915
1956	10,550,942,886	8,108,352,851	876,333,430	3.95	1,042,664	5,324,672,032
1951-55*	10,222,539,349	7,651,988,376	806,122,230	3.92	1,166,280	5,154,971,427
1946-50*	8,807,505,243	6,915,562,147	537,159,983	3.54	1,290,105	4,460,823,987
1941-45*	8,041,257,076	5,451,293,366	678,515,553	4.97	1,320,001	3,300,920,900
1936-40*	4,015,179,679	2,956,063,183	84,249,878	2.51	1,026,796	1,881,436,311
1931-35*	3,426,800,707	2,582,163,095	-3,930,539	1.94	1,052,738	1,634,976,319
1926-30*	6,038,338,548	4,421,698,908	737,898,336	4.80	1,663,896	2,826,248,509

*Annual averages.

†Preliminary.

Sources: "Yearbook of Railroad Information, 1958"; Association of American Railroads.

Featherbedding: Rail Strike Threat

METALWORKING MEN will be more than casual onlookers in the new fight shaping up over featherbedding in the railroad industry. While the practice is no problem to metalworkers directly, it poses the threat of a huge railroad strike in the fall.

The old battle was reopened earlier this month when Daniel P. Loomis, president of the Association of American Railroads, appealed to the leaders of train operating brotherhoods to co-operate in asking for a special Presidential commission to help work out a solution to the problem. The Railway Labor Executives' Association immediately rejected the idea. The present three-year labor contract expires on Oct. 31.

• **Threat to Shipping**—This sets the stage for a major railroad workers' strike which could tie up close to 900,000 trainmen and bring the nation's distribution system to a crawl. For management's part, it does not like the timing. In 1958, it would have had the recession working in its favor. (See table above for effects of recession.) But next fall, economic pressures from the recovery will be on the side of the unions.

• **Definition**—Featherbedding is the practice of paying for work not done. Its three most objectionable forms in the railroad industry are:

1. Dual-mileage basis for paying train crews, which sets up the working day on a mileage or time limit, whichever comes first.

2. Jurisdictional work separations —rules which ban road crews from working in yards (and vice versa) and train crews from crossing district and seniority boundaries.

3. Unnecessary job requirements, such as firemen on diesels and brakemen who don't tend brakes.

Mr. Loomis claims the regulations were set up as much as 40 years ago under completely different circumstances. He blames the high cost of this practice for higher travel fares, higher freight rates, and higher costs generally, which have led to a loss of business to other types of transportation. This, in turn, has reduced the industry's employment totals.

• **Union Rebuttal**—In refusing to go along with the proposal for an investigation, the union executives claim: "All recent studies have shown that railway labor productivity has been rising steadily in recent years. We do not favor wasting the public's money by the setting up of a Presidential commission to study this already much-hashed-over matter. We have no doubt that it . . . would simply renew the same findings of previous boards that the alleged 'featherbedding' problem simply does not exist."

Coming: Used Tool 'A&P'

One stop shopping, supermarket-style, will be set up by Clevelander for eight lines of capital goods. Engineering, financing, and leasing are included

A SUPERMARKET for used capital goods will be opened in Cleveland soon. Daniel G. Richman, president of AAA Machinery & Equipment Co. is outfitting a 300,000 sq ft building to store, rebuild, and display eight lines of used capital goods items.

The company has been selling machinery to the foundry and heat treating industries for five years. Now it will also offer used machine tools, forging, material handling, electric, processing, and steel mill equipment.

Under a five year diversification plan, the firm will set up eight divisions, each headed by an expert. Each man will handle his division's customer relations and sales. The company will provide centralized rebuilding, engineering, shipping, billing, and accounting.

• **How It Operates** — AAA leases used equipment with options to purchase, sells outright, and finances purchases up to three years.

Mr. Richman estimates that the company processes 75 per cent of the used foundry equipment sold annually in the U. S. and does $1.3 million to $1.5 million a year in sales. Another $2 million last year came from handling the liquidation of 14 plants. The company's inventory has an as-is value of $400,000. With reconditioning and rebuilding, the equipment will have a potential sales value of $1 million. Mr. Richman estimates the equipment, if new, would be worth about $4 million.

• **First Sale**—The 32 year old executive was working in government surplus about five years ago when he saw the vast potential in used machinery. He and his brother Fred, 27, who is vice president, recall their first sale—a small jolt squeezer which went to a foundry in Oklahoma. The two men put three coats of paint on the rebuilt machine, then waxed and polished it to a gleaming finish before shipping. The customer called and raved about the beauty of the machine but wondered where the other half was—the compressed air fittings were missing. The foundry is still an active account, and the brothers have learned to rely on technical advisers.

The company did $30,000 in used equipment business the first year and has doubled its sales nearly every year since then. AAA's first home had 3000 sq ft of floor space which the brothers had to expand several times. Seven months ago, the firm moved to a converted trolley barn (with 20 times more space), but it has already reached the end of the line with it. Some 500 semi-trailer loads of equipment are packed in orderly rows in the barn's three huge bays. AAA will move again—this time to the equipment supermarket.

• **Customer Is King**—How did the growth come about? The young executives know the market and have instituted careful inventory control. But most of all, says Dan Richman, the business is based on mutual trust between the company and its 2500 customers. Evidence: 95 per cent of sales are made over the phone—before the customer has had a look at the machinery. Large inventories are carried so the customer knows that equipment is always available.

DANIEL G. RICHMAN
President
AAA Machinery & Equipment Co.

Another of AAA's policies: Follow through with guarantees and service. A personal letter is sent to the customer after a sale, asking: Are the equipment and service satisfactory? Has undue repair or maintenance been necessary? Is the equipment as represented? How does the customer rate it? As to guarantees, the firm once honored a request for $900 in repairs on a machine that had been in service 18 months after the sale. Normally, the time limit is 30 days, and AAA offers to pay the freight for the return of unsatisfactory equipment.

• **Market Changes**—Dan Richman says that mergers and consolidations have put a lot of surplus equipment on the market. And some plants with captive foundries have discovered that it is sometimes cheaper to buy castings than make them, so they are disposing of equipment.

What does it cost to equip a plant the AAA way?

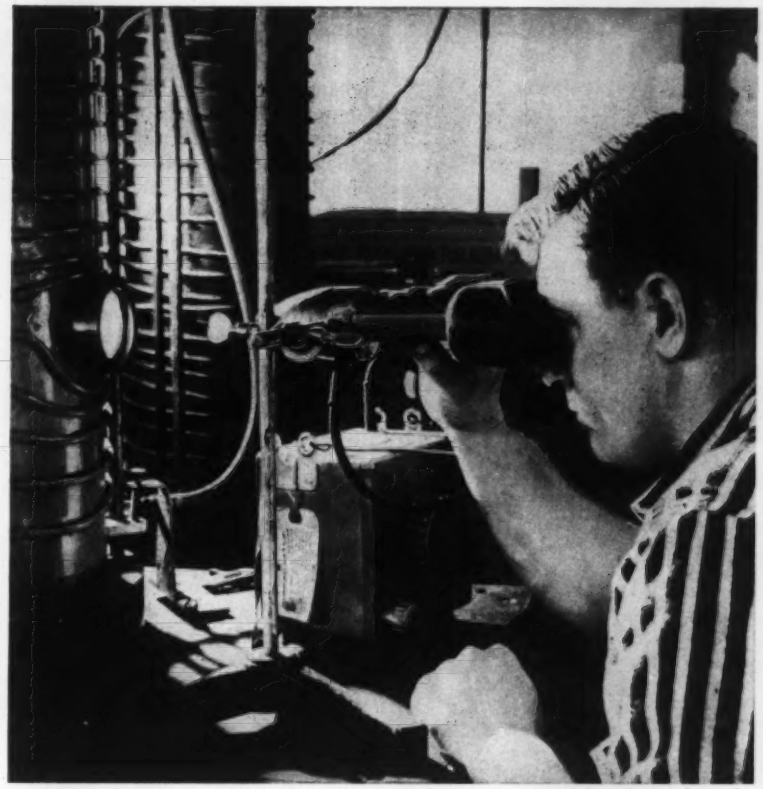
Example: A foundry in Pennsylvania was completely equipped for $83,000, including engineering detail, moving, and placement. An international customer (most are in the Western Hemisphere) has placed a $150,000 order to equip a foundry in Chile.

NLRB Cases Set Records

For the fifth consecutive quarter, the number of unfair labor practice charges filed with the National Labor Relations Board reached an all-time high at 3039 in the fourth quarter of 1958.

Other records: Charges filed against employers, 2219; greatest number of complaints issued in any one quarter by the general counsel, 249.

Representation cases filed totaled 2007, 31 per cent more than the corresponding period of 1957. Employees chose a collective bargaining representative in 869 of 1421 elections. Unions won 21 of 38 decertification elections, but lost five of nine deauthorization contests.



Chase Brass & Copper Co.

Researcher measures sintering temperature of rhenium bar with optical pyrometer

Expensive Metal, Rhenium, Vies for Hot Space Jobs

ELECTRICAL PROPERTIES of rhenium, a rare, costly metal, may allow a major breakthrough in the Space Age search for more reliable electrical and electronic components that will reduce failures in rocket and missile controls.

• **First Wrought Producer**—Commercial production of wrought rhenium rods, wire, and strip is being scheduled by Chase Brass & Copper Co., a subsidiary of Kennecott Copper Corp. Until a few years ago, the metal was limited to laboratory uses. Potential production capacity in the U. S. is estimated at 20,000 to 30,000 lb per year—it's now close to 100 lb annually.

The metal (it costs about $1.50 per gram in powdered form) has a melting point of 5756° F, which is surpassed only by tungsten and carbon. Its most important applications are in thermocouples made of rhenium and tungsten which permit measurement and control of temperatures up to 4500° F.

• **Great Life**—"For certain applications," Chase says, "electrical contacts of rhenium have a life expectancy 20 times greater than those of any materials currently used." Example: Rhenium relay contacts exhibit high wear resistance, offer great stability under high temperature arcing, and have high corrosion resistance.

The company notes that the metal is also suited for filaments and structural components of electronic tubes. Its properties include: Good weldability, high purity, and high temperature strength and ductility at room temperatures which permit easy forming and shaping. Other filament applications: Mass spectrographs and ion gages for measuring high vacuum.

• **Valuable Alloys**—Rhenium also holds great promise as a possible welding material for molybdenum, either in its pure state or alloyed with molybdenum. The close association between the two metals starts with the ore. (Rhenium is a byproduct of the roasting of molybdenum oxide.) Research and tests over extended periods have shown that rhenium-molybdenum alloys, which cost less than pure rhenium, have better mechanical properties than molybdenum.

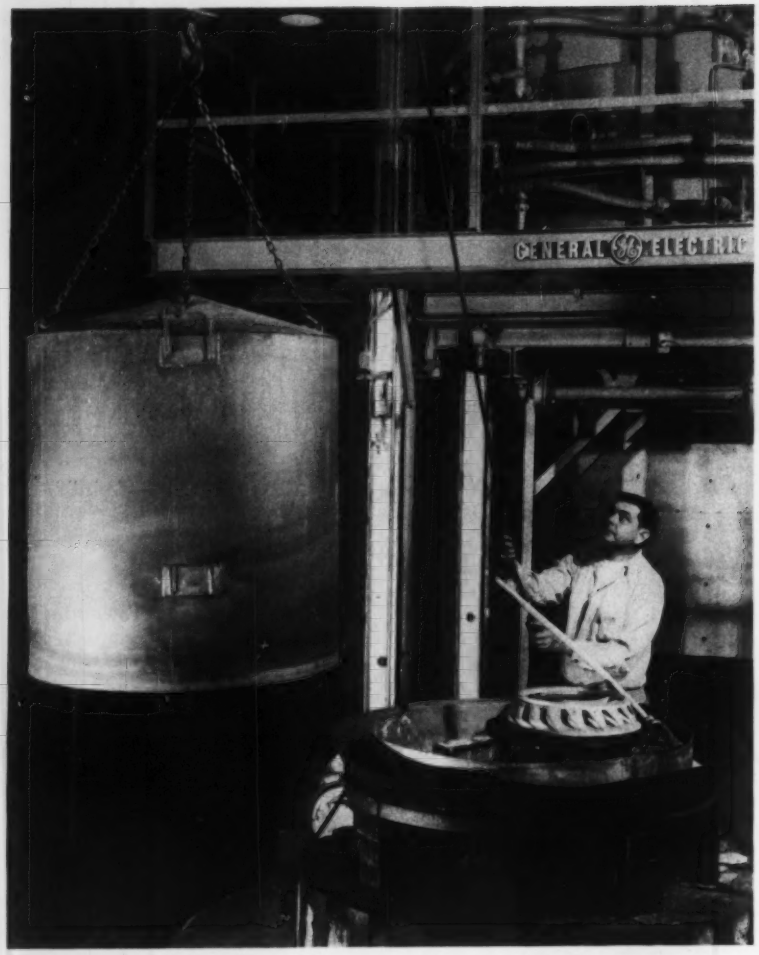
Ontario Seeking More 'Made in Canada' Goods

A campaign to promote the expansion of business and to attract new industry from other countries is being sponsored by the Trade & Industry Branch, Ontario Department of Planning & Development.

Reason: Nearly three-quarters of Canada's imports in 1958 were fully manufactured products. In 1957, that figure was 77 per cent.

Plugging the "fabrication gap" is particularly important to Ontario which accounts for half the value of Canada's manufactured goods. The province will have to find jobs for 55,000 new workers over the next 20 years. (Its present force: 2.2 million). Another factor: 50 per cent of all immigrants to Canada settle in Ontario.

Iron and its products (the largest commodity group) account for 38 per cent of Canada's imports. The U. S. is the nation's leading supplier. The value of U. S. imports has increased 102 per cent over the last ten years.



A new, high temperature, gas fired brazing furnace (it provides temperatures up to 2150° F) is in operation at General Electric Co.'s Small Aircraft Engine Dept., Lynn, Mass. Stainless steel jet engine components for T58 and J85 aircraft are placed in an alloy retort, then hoisted into the heating chamber for treatment in a controlled atmosphere. Oxidation and distortion are eliminated

New Uses, Economy's Upturn Will Boost Brazing Growth

BRAZING is certain to expand this year with rising activity in the metalworking industry. Industry sources expect gains over 1958 of 10 to 20 per cent.

• **New Uses**—Wider knowledge of the process and the economies it offers are influences in the growth pattern. New applications are extending the perimeter. Examples: Fabricating honeycomb sections in aircraft construction; high temperature applications in the rocket, missile, and space fields.

While most brazing is done on a captive basis, as part of a production setup, a number of shops specialize in the process. Some do brazing exclusively; others include it as part of general heat treating operations. For the most part, it is the corollary of other metalworking joining operations.

Commenting on growth in recent years, Edward J. McCrink, president, Hi-Temp Inc., Northlake, Ill., states that monthly sales in early 1950 were half of present levels. A. R. Ryan, manager, process and industry market development, Industrial Heating Dept., General Electric Co., Shelbyville, Ind., cites growth in the last ten years in the aircraft industry and points out that brazing is becoming increasingly important in missile manufacture, especially in large, liquid fueled engines.

• **No Recession**—Charles A. Mueller, Gas Process Div., Lindberg Engineering Co., Chicago, states sales in 1958 were about the same as in 1957 despite the recession. He says that the newest applications are in high temperature processes.

Stainless Processing Div. of Wall Colmonoy Corp., Detroit, notes that brazing of stainless steel has been confined for the most part to high temperature service in the aircraft, missile, rocket, and atomic energy fields, but is beginning to break out into the commercial food machinery field.

E. N. Case, sales manager, Ajax Electric Co., Philadelphia, thinks business volume may improve 10 to 20 per cent this year over 1958. He says that any substantial increase in use in the aircraft industry or production of a brazed type automotive radiator would rapidly boost volume.

• **Aircraft Programs**—A. N. Kugler, chief welding engineer, Air Reduction Sales Co., New York, expects several large aircraft honeycomb structure programs to get underway this year with requirements for brazing alloys running into thousands of pounds per plane.

Vincent R. Troglione, vice president and general manager, Sunbeam Equipment Corp., Meadville, Pa., sees use growing because of dollar savings and the demand for precision, high strength assemblies. Among new applications, he cites fusing the skin surfaces of aircraft wing sections.

One significant use for the method, says M. I. Russell, of Edw. E. Russell Co., Wallingford, Conn., is the copper brazing of carbide grit

to steel sheets or bars to make a permanent abrasive.

A. M. Setapen, manager, Brazing Products Div., Handy & Harman, New York, anticipates 1959 consumption of brazing materials will be 10 to 15 per cent higher than in 1958.

Fusion Engineering, Cleveland, reports that silver brazing is increasing in automated assembly lines. With development two years ago of new paste brazing alloys and a cheap, fast method of applying the alloys automatically, slower methods are being replaced.

• **Background**—The brazing process, little understood or employed before World War II, came into its own during the war when high speed, quantity fabricating was essential. Its advantages: 1. Complex assemblies can be made from formed components, saving materials and lowering machine costs. 2. Assemblies can be made from two or more different alloys to meet specific design requirements. 3. Thin sections that cannot be machined feasibly can be brazed to heavier sections without sacrificing strength.

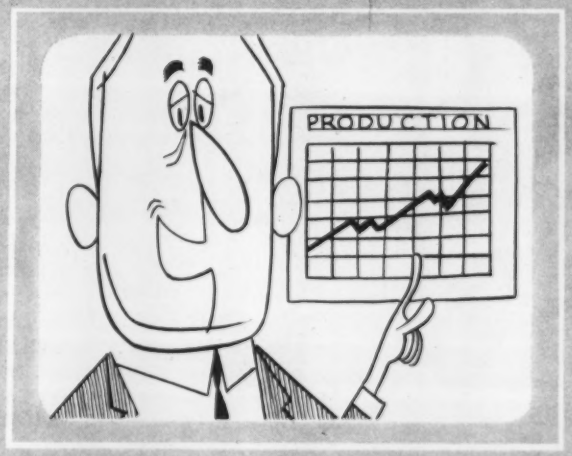
In all brazed assemblies, successful joints depend on proper design. Filler metals are drawn into the joint by capillary attraction and partially diffuse into the base metal, forming a new alloy with new properties. The thin braze which results can be held to close tolerances, exhibits good shear strength, and is economical.

Texas Work Law Flops

"The real meaning of the Texas right-to-work law seems to be symbolic," says Prof. Frederic Meyers, University of California, in a Fund for the Republic report. The freedom concepts of its advocates have not been upheld in practice, and the fears of the unions have not materialized, he notes.

Example: Though union membership is not compulsory, organization of the unorganized has proceeded at a rapid rate since the law's inception in 1947.

Another effect: Since unions can't force employees to join and stay in the union, tiny vocal minorities sometimes use the threat of withdrawal to pressure the union.



Informing Workers via TV

CLOSED circuit television provides a new dimension for approaching the employee communications problem.

Hallamore Electronics Co., Anaheim, Calif., set up a one-man TV studio and positioned 90 receivers through its 110,000 sq ft plant. Its nearly 1000 employees can view TV screens without leaving their offices, desks, or work stations. Costs: $15,000 for the studio, $12,000 for installing the system, $200 to $400 per receiver.

At last week's American Management Association personnel conference, D. M. Snow, director of industrial relations described some of the activities Hallamore televises (see below). Most are run during the lunch period.

• Service pins are presented to employees—the employee's family, his hobbies, experiences, and background are discussed in informal interviews.

• The president reports monthly on the firm's business—20 to 30 minute talk on company contracts, the business outlook, special problems.

• During recent political campaigns, major office seekers discussed platforms and propositions on the ballot.

• Names of visiting dignitaries are flashed on the screen so employees know who the guests are.

• Each week a telephone girl is selected at the plant. During the program, employees can phone in questions about the company or activities which are answered over the TV.

• Movies of a company picnic at Disneyland were run.

• Special problems are handled. Example: Some misunderstanding developed over the proper way to fill out time cards. The procedure was outlined on TV, and the problem was eliminated.

• Hallamore has arrangements with local CBS and NBC stations to carry major events. Example: President Eisenhower's mid-afternoon announcement to move troops to the Mideast.

What Change for Labor Reform?

DON'T BE misled if Sen. John Kennedy's (D., Mass.) labor bill, S.(505), passes the Senate. It will not be a case of a dynamic, young David slaying the giant. Indeed, conservative sources on Capitol Hill will charge that David sold out to Goliath this time. Variously described as a "sweetheart" bill for labor and "little better than nothing," Senator Kennedy's efforts appear to be no different from last session's Kennedy-Ives Bill which got out of the Senate but was voted down by the House. This year, the House will be even harder to please. Not that the House will think S.(505) too easy on the unions; rather, the House will vote in favor of no labor legislation at all.

In the long fight to restrict the union activities, 1959 shapes up as a dull year. Some conservatives are tempted to avoid another showdown, such as that forced last year by William Knowland, former Republican senator. They fear that they'll cause more harm than good. A few are counting on a long steel strike this year to "alert" the public to the dangers of "monopolistic" unions. If the public outcry warrants it, they will concentrate their efforts on next year's Congress, when a Presidential election would make their viewpoints more significant.

The more liberal element on Capitol Hill would like to see quick passage of the Kennedy Bill this year so that they could take care of labor "reform" and concentrate on the missile "gap" in next year's pre-election session.

Mills States His Tax Stand

The long awaited pronouncement of Ways & Means Chairman Wilbur Mills (D., Ark.) is here: This Congress will do nothing significant about taxes. He predicts extension of corporate and excise taxes for another year and no boost in gasoline taxes. Representative Mills also wants a study of our tax structure to "intelligently broaden the tax base." His purpose: To make tax reductions (in the far future) possible. As chairman of the tax writing committee, he has the power to call for such an investigation whenever he wishes. As yet, no date has been set.

Congressman Mills's statement sets the scene for amendment of the Highway Act to allow general federal revenues to go into building our 41,000 mile federal highway system. Look for the Byrd pay-as-you-go rule (which forced the road program to live within the money in its trust fund) to be dropped until 1961, when Bureau of Public Roads will report to Congress on the status of the program and recommend new financing methods. President Eisenhower wants the gasoline tax boost to keep the roads on the pay-as-you-go route.

More Ships Wanted for Ocean Research

The National Academy of Sciences is putting the pressure on Capitol Hill to double our spending on ocean research in the next ten years. Of interest to metalworking: $213 million would go for 70 new ships to study the ocean bottom for antisubmarine warfare, mapping of the currents, and other projects.

Included in the NAS report is a recommendation that a study be made of the feasibility of dredging metallic nodules on the bottom of the Pacific Ocean. The metal in 1 million square miles of the Pacific is estimated to be worth $500,000 per square mile.

Douglas Committee Sets New Inquiry

The broadest economic inquiry of the decade will be headed by liberal Sen. Paul Douglas (D., Ill.). His Joint Economic Committee will consider "the problems of providing substantially full employment and an adequate rate of economic growth, as well as maintaining price stability and preventing inflation."

Subjects include: 1. Historical rates of unemployment, production, and prices. 2. The effects of "classical" inflation and deflation (increases and decreases in the money supply) on growth, employment, and economic stability. 3. The effect of monopolistic practices. 4. How wage increases and union practices influence prices, profits, and employment. 5. The influence of government spending. 6. International influences.

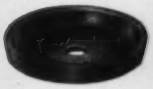
FRB Rejects Administered Price Theory

Gardner Means, economist and star witness before the Kefauver subcommittee's hearings on administered prices, took a sharp setback from the Federal Reserve Board last week. An FRB spokesman discounted Mr. Means's theory that the 1953-58 inflation was caused by concentrated industries as only a partial explanation. The FRB endorses the contention of steelmen that if they set prices too high, other metals, like aluminum, would take over their markets. The spokesman also explained part of the inflation as pent-up demand caused by the steel industry's own needs for new capital equipment.

C/R Shaft Type Oil Seal

C/R Standard End Face Seal

C/R Sirvene Diaphragm



C/R Sirvis Molded Cup

C/R Rawhide Beveled Gear

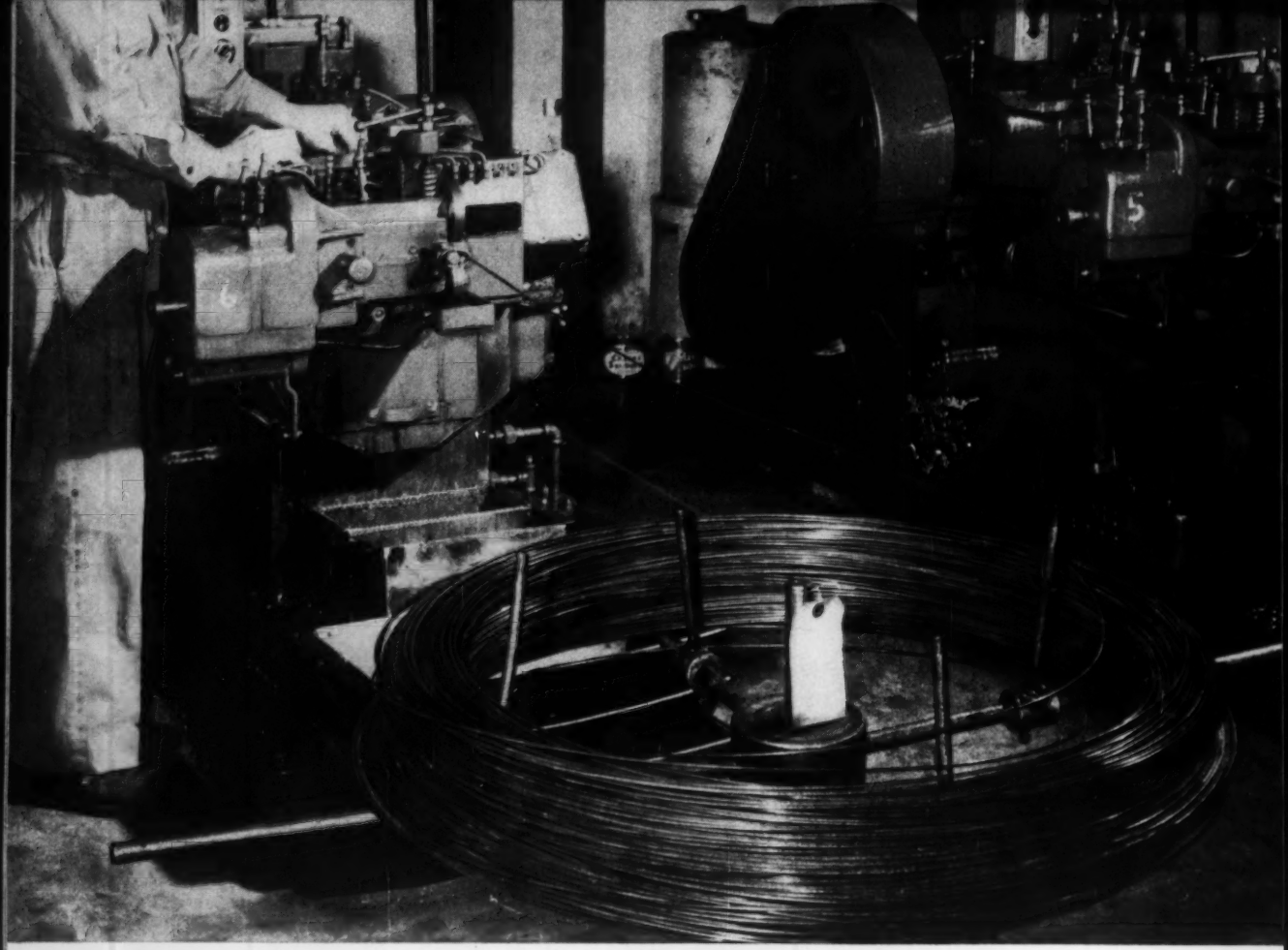
Here's an expert at work, saving you money at the right time — during design. Like all C/R sales engineers, he's an experienced, well-trained representative whose knowledge springs from a solid engineering background. His ability to sit down with you during the design phase will help develop the most efficient and economical solutions to your problems.

For example, he will often suggest design modifications that may save substantial production costs. Again, he will advise against specifications or seal types which he knows from experience will lead to service problems and user dissatisfaction. His personal "value analysis" of your fluid sealing problems, backed by the quality of these Chicago Rawhide products, can save you money. Welcome him when he calls to see you.

CHICAGO RAWHIDE MANUFACTURING COMPANY
1245 ELSTON AVENUE • CHICAGO 22, ILLINOIS

Offices in 55 principal cities. See your telephone book.
In Canada: Manufactured and Distributed by Chicago Rawhide Mfg. Co. of Canada, Ltd., Brantford, Ontario.
Export Sales: Geon International Corp., Great Neck, New York

C/R
CHICAGO RAWHIDE



The high degree of plasticity of J&L special heading screw wire and its freedom from surface defects have virtually eliminated splitting problems for Midland Screw Corp.

At Midland Screw Corporation

J&L special heading screw wire solves tough recessed-head screw production problem

Midland Screw Corp. of Chicago, at its Millersport, Ohio, plant has found J&L special heading screw wire ". . . a consistently high quality product that we can depend upon."

Midland makes 4,500 kinds of screws, all to very close tolerances. The recessed-head types include round heads, oval heads, pan, flat heads, truss heads and others.

Recessed-head screws are tough to make because of the extraordinary demands on the steel wire during multiple heading operations. The wire must have a high degree of hardness. And, *after* it has become even harder from the initial cold heading blows, it must have enough plasticity to take the final indent.

The wire must be free from harmful surface defects. Since the pressures involved alone are sufficient to cause serious splitting with ordinary heading wire, any seaminess can accentuate this problem.

Midland also uses J&L special heading screw wire for other screws with heads that are difficult to form. One of these, made from .133-inch wire, is an indented hexagonal washer head. The washer on the finished screw is .370 inch—or almost three times the diameter of the wire.

For more information on J&L special heading screw wire, call your J&L representative. Or write to Jones & Laughlin Steel Corp., 3 Gateway Center, Pittsburgh 30, Pa.

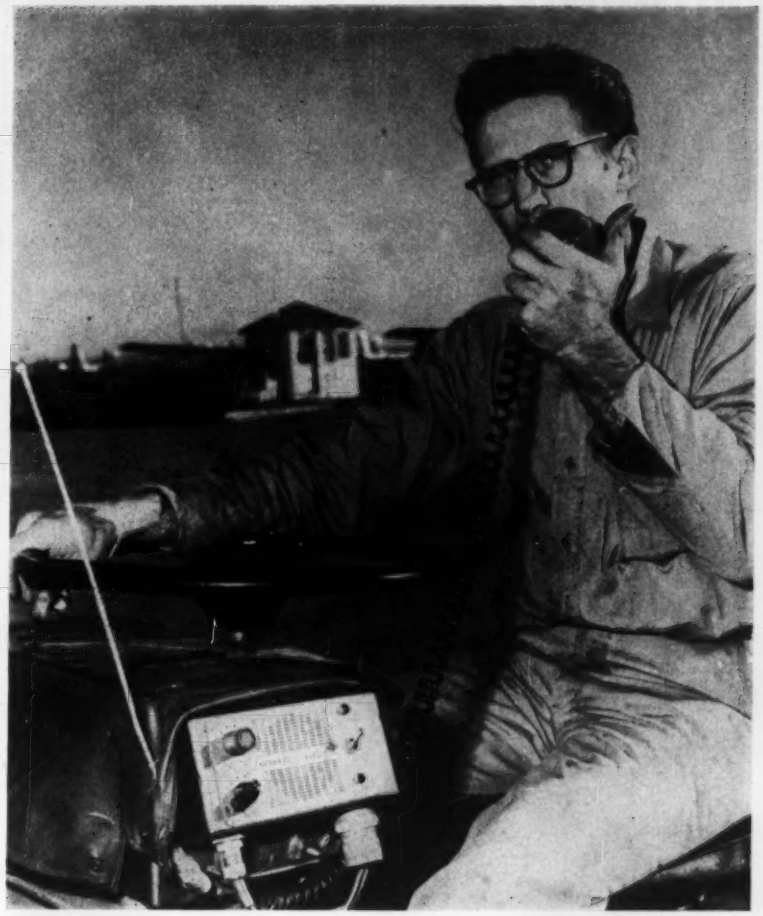
Midland makes recessed-head screws at rates up to 13,800 per hour on each machine by using J&L special heading screw wire.

The exciting new J&L

Jones & Laughlin Steel Corporation

PITTSBURGH, PENNSYLVANIA

STEEL



General Electric Co.

Your Company Can Get Two-Way Radio Now

INDUSTRY IS "calling all cars," trucks, and people with its new aid to efficiency, the two-way radio.

Volume will exceed last year's by 10 per cent, to bring mobile radio sales above $65 million. One of the big reasons: More frequencies are becoming available as the Federal Communications Commission splits channels in the radio spectrum.

• **Opening Up** — Under the new rules, virtually any legally operated business may apply for two-way radio. General Electric Co.'s Lacy W. Goostree, marketing manager, Communication Products Dept., voiced: "We are enthusiastic about the prospects for the mobile radio communications industry in the next few years. GE's sales in 1958 were more than double what they were in 1953 and 15 times what they were in 1948."

Others are also optimistic. At the beginning of 1958, Arthur L. Reese, vice president and general manager for communications and electronics at Motorola Inc., expected sales to be 10 per cent above 1957's. The goal was surpassed despite a mid-year lull—thanks to a dynamic fourth quarter. The spurt is likely to continue through 1959. Radio Corp. of America reports a similar pattern.

• **FCC Ruling**—On Aug. 1, 1958, the FCC cut the width of allocated slots, effectively doubling space in the two-way band. Mobile and base transmitters now maintain tighter specifications to operate within the narrower split channels and to avoid interfering with adjacent channels. This deviation adjustment went into effect Feb. 1. Users in FCC's manufacturing, trucking, and construction classifications now have more room and greater flexibility.

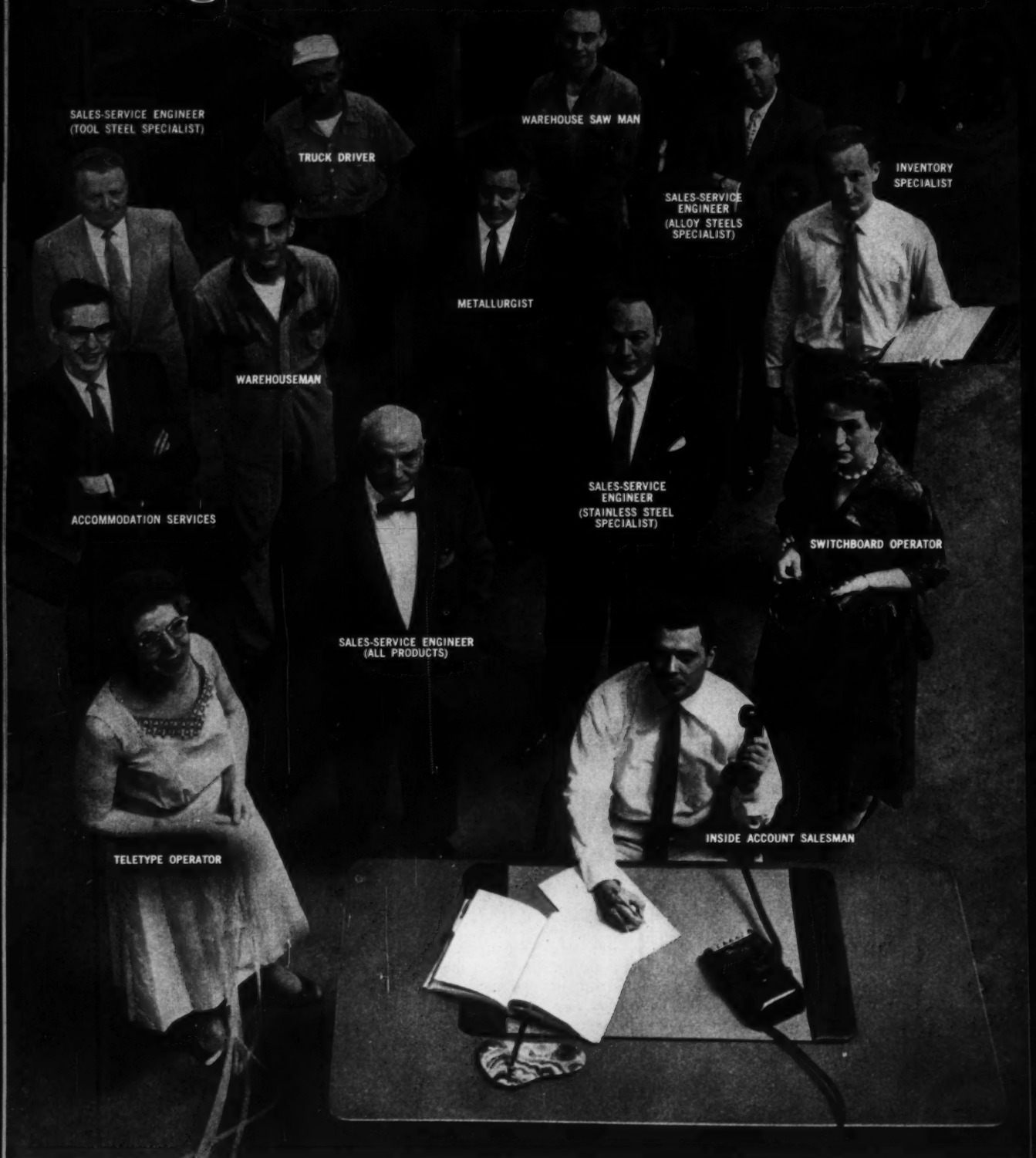
Something new was added: Some split channels in the mobile radio band were allocated for use by anyone in business. Many companies were formerly permitted to use only the higher frequency citizen's band. The original equipment cost is higher, and the range is limited. As a result of the FCC ruling, virtually all businesses are favored by lower initial equipment costs and the generally better range of the low band.

• **Advantages** — Radio dispatching can lessen driver lost time, reduce aisle traffic, and smooth out peak loads. An owner of a ready-mix concrete business says that the two-way radio is as important as the mixers on his 70 trucks. Belt carried, two-way units, and executive paging systems are available.

Radio equipped fork lift trucks at the Cleveland Ford engine plant reduce production line downtime. Judgment can be assumed by the dispatcher instead of the driver. Mobile radio has permitted a more efficient use of company vehicles, says L. I. Wilson, Chrysler vice president.

• **Radio Market**—Estimated market breakdown: Industrial and public safety applications, 25 per cent (each); trucking, 13 per cent; taxis, 6 per cent; common carriers, 5 per cent; government, 10 per cent; and miscellaneous, 16 per cent. At one time, police and taxi services represented the biggest categories. Today, it is estimated that over 60 per cent of sales are for other uses.

integrated CRUCIBLE steel service



Local Crucible personnel provide service in depth, ranging from quick reports on steels available to expert assistance with metal working problems.

Average warehouse staff is backed up by Crucible Metallurgists who, although located at mills, will travel.

maintains a variety of local facilities for handling customers' special requirements

"We *regularly* rely on the Crucible warehouse's equipment. Why, it would take us all day to cut steels they can cut in minutes. We've tried to do these cutting jobs ourselves and, frankly, we lose money nearly every time."

This purchasing agent's words are probably typical because countless companies, all over the country, rely on the 31 local Crucible warehouses for handling their special needs. Unusual cutting of specialty steel grades and sizes is just an example. Or, if a warehouse can't handle extras, such as forging, grinding, machining, boring, polishing, etc. itself, it arranges to have them done conveniently and economically outside.

It's entirely possible that your plant has these facilities. Even so, it can pay you to find out what the local Crucible warehouse has to offer. As one materials buyer put it:

"We have a 'get to know the suppliers' policy. I've visited the Crucible warehouse personally and made a list of its equipment. Here it is – under 'Suppliers' Facilities.' Two weeks ago, when all our saws were tied up, we had the Crucible warehouse cut the steels. They did it immediately, so my list paid off."

All Crucible warehouses maintain stocks, services and facilities to serve you. If you'd like to know more about them, phone or visit the warehouse nearest you – *any time.* Its facilities and services are part of Crucible's integrated operation, from ore to mill and warehouse delivery to you. *Crucible Steel Company of America, Dept. PB15, The Oliver Building, Mellon Square, Pittsburgh 22, Pa.*

Customers' Master Files quickly give Inside Account Salesmen details on your receiving schedules and special requirements.

Inside Account Salesmen keep reference sources handy — give you fast breakdowns of analyses, or heat-treating, machining data.

Fleet of trucks and special delivery vehicles maintained at each warehouse ensure prompt, nearby deliveries.

Full stocks of specialty steels enable warehousemen to ready your order for shipment overnight — or earlier.

STOCK LIST

Keeps you up-to-date on local stocks of specialty steels. Just ask the Crucible salesman to place your name on the regular mailing list.

One Source For All These Steels

TOOL STEELS–Water, oil, air hardening, shock resisting, hot work, plastic and die casting steels in all forms, including bars, sheets, plates, drill rod, hollow bars, forgings and flat ground stocks

HIGH SPEED STEELS–Crucible's famous "Rex"® steels: Rex Thrift Finish rounds, hot rolled and cold drawn flats and squares, drill rod, forgings, sheets, plates, and tool bits

STAINLESS STEEL – Bars, sheet, strip, wire, cold heading wire, metalizing wire, plates, angles

FREE MACHINING STEELS – Crucible Max-el® rounds, hexagons, plates and brake die steel

ALLOY STEELS – bars, billets, strip and sheet

COLD ROLLED CARBON SPRING STEELS

DRILL STEELS – Hollow and solid drill steels

ALUMINUM EXTRUSION DIE STEELS

HOLLOW TOOL STEEL

WELDING AND HARD FACING ROD

PLASTIC MOLD STEELS

PERMANENT MAGNETS

– and many others

CRUCIBLE STEEL COMPANY OF AMERICA

Branch Offices and Warehouses: Atlanta • Baltimore • Boston • Buffalo • Charlotte • Chicago • Cincinnati • Cleveland • Columbus • Dallas • Dayton Denver • Detroit • Grand Rapids • Harrison • Houston • Indianapolis • Kansas City • Los Angeles • Milwaukee • New Haven • New York Philadelphia • Pittsburgh • Portland, Ore. • Providence • Rockford • Salt Lake City • San Francisco • Seattle • Springfield, Mass. • St. Louis St. Paul • Syracuse • Tampa • Toledo • Tulsa • Toronto, Ont.

How Inflation Hit U. S. in Last Decade

Cost of Living	Up 20%
Federal Budget	Up 100%
Federal Tax Receipts	Up 91%
Employee Compensation (per manhour, including fringe benefits)	Up 80%
Manufacturing Output (per manhour)	Up 43%

Source: H. G. Bixby, Ex-Cell-O Corp.

Tariffs Threaten Economy, Warns Ex-Cell-O President

"ARTIFICIAL TRADE WALLS are endangering the Free World. We should scrap our outmoded adherence to protective tariffs and restrictive measures," states H. G. Bixby, president, Ex-Cell-O Corp., Detroit, machine and cutting tool firm. "The U. S. cannot be walled off from the rest of the world. We have made a fetish of free competition within our own country, but have erred in assuming competition is good only inside America," he continues.

"Americans have the false impression that the world cannot get along without them. We have no monopoly on natural resources, brains, or technical wisdom. Our sense of supremacy has lulled us to sleep with the illusion that there is still safety behind the barriers of tariffs. We don't have more than ten years to get over this complacency."

• **Foreign Progress**—Mr. Bixby believes it is imperative for U. S. business to realize that nationalism is spreading like brush fire throughout the world. Nations are striving for self-reliance, political and economic independence.

Foreign nations, particularly the Iron Curtain countries, are making great strides in technology, nullifying the old argument that foreign products may be inferior. There are strong pressures in many countries to produce and buy at home.

• **Inflation Danger** — "When the products of two companies are nearly equal," says Mr. Bixby, "the customer will usually buy the cheaper one. Continued unchecked inflation keeps us from competing, yet we still hear prolonged and impassioned demands for more and more in return for less and less." (See table.)

"The wage-price push is rendering our machine and cutting tool industries, in particular, noncompetitive in world markets and is bringing about more imports.

"Labor has an equal responsibility in keeping our free economy strong. Persistent headlong spirals of unreasonable wage demands can price American products out of the market and hang the wreath on the doors of American business. It is hard to find the featherbedding practices in Europe that are sapping the strength from American industry."

In 1957, this country sold $90.6 million worth of machine tools abroad. Last year, exports totaled $53.6 million. "And there are portents that the coming years will show a continual decline."

• **Facts To Consider**—Mr. Bixby recommends that U. S. business assess these facts:

1. The European market is expanding. Europe's population is 50 per cent larger than our own. Its income and capacity to consume will grow.

2. Europe will hurl increased competition within our borders. Our imports of nonagricultural products have soared from $750 million to $2.5 billion in the last decade.

3. European competition will be much livelier in world markets. It already sells two and one-half times as much as we do abroad.

4. U. S. investments in Europe will have to be accelerated to cope with competitive forces. They have climbed from $1.4 billion to $4 billion since 1949.

• **Common Market Formed** — Six European countries have overcome ethnic differences and political animosities to forge an economic union of vast potential, the European Common Market. This market will end multiplicity of tariff and custom regulations. Nonmember nations can ship to any part of the group under a uniform set of conditions.

Nonmembers can also brace themselves for stiffer competition from countries both within and outside of the Common Market. Example: A German time instrument firm now ships to France with an

import duty of 31.5 per cent. Duty on American goods is 35 per cent.

By the early 1970s, Common Market members will have reduced quota limitations by 20 per cent and possibly will have eliminated all tariffs. Logically, a power play may follow to force reductions of tariffs outside trading countries. The end result could be free trade around the world. The Scandanavian nations have plans to form a common market of their own. Ten countries have acted to make their money more freely convertible with the dollar and other currencies.

• **Trade with Reds**—"Tariffs are the last stronghold of medieval thinking," continues Mr. Bixby. "Refusal to trade with Russia and Red China will not hold them down. It may make their development more difficult, but they will get what they want someplace else.

"Red China is a country with an unlimited supply of manpower and a bottomless appetite for goods. But it's a dead market for us—off limits to U. S. trade. China is industrializing at a startling pace—even Russia is worried.

"Russia's industrialization has been fantastic, and our tendency to downgrade Russian ingenuity has disappeared with Soviet jets breaking speed records and sputniks in orbit."

• **Matter of Time**—Our exports to the Soviet Union, and satellites in the first half of 1958, totaled but $48 million, against imports of only $29 million (mostly nonindustrial goods such as furs, precious stones, and glass).

"It's a mere question of time," Mr. Bixby laments, "when the Soviet countries will be exporting elaborate machine tools. They have no competitive enterprise and can price their equipment to meet their political goals."

He reports that Iron Curtain tools are now available at 25 per cent less than similar U. S. equipment.

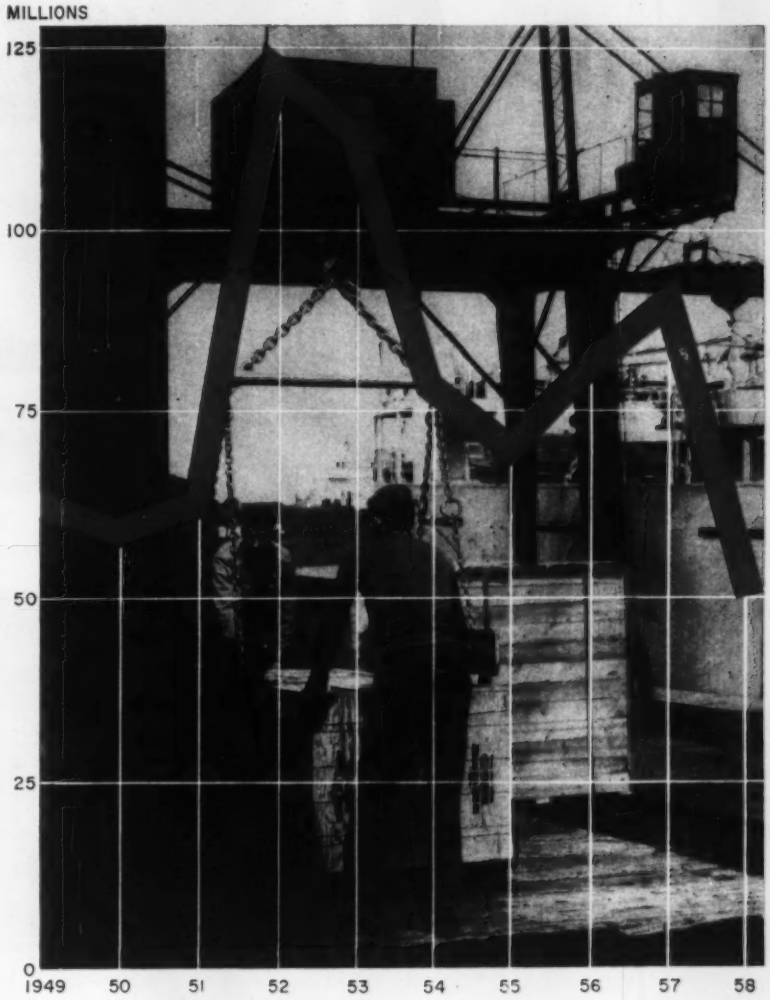
• **America Outclassed**—Mr. Bixby relates that a British cammaker uses cam millers made in the U. S. and in Czechoslovakia. The firm claims the Czech machines are more accurate, more productive, more automated, and cost 75 per cent less than their U. S. counterparts. Result: When work is slow, the American made machines are idled.

He adds, "Even our foreign subsidiaries, which are separate entities for the record, cannot trade with Red countries."

Mr. Bixby concludes, "I don't want to leave the impression that I am advocating all-out trade with the Reds and damn the consequences. As we reduce barriers to imports, foreign nations should reciprocate and reduce trade barriers against our exports. We must face the realities presented by the vibrant forces at work around the world. We must not think only of the U. S. as our market, but snould broaden our horizons to encompass the globe."

How Machine Tool Exports Slip

(Cutting type)

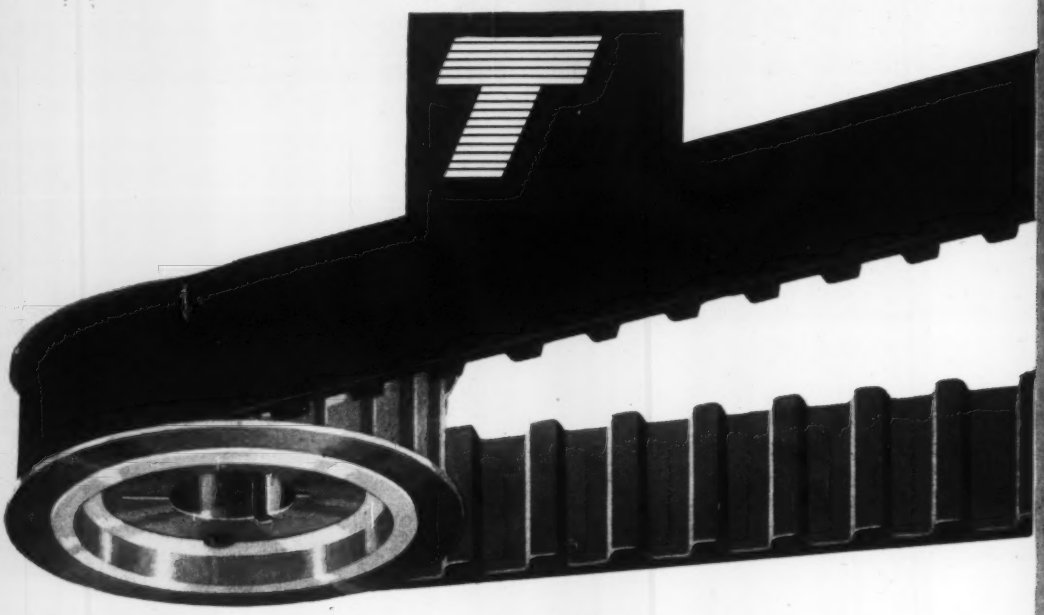


Source: National Machine Tool Builders' Association.

Extends Cutter Service

Cutting Tool Div., Brown & Sharpe Mfg. Co., Providence, R. I., announces establishment of Brown & Sharpe Cutter Service Co. of New Jersey, 590 Grand Ave., Ridgefield, N. J. This cutter and tool sharpening service is an independently operated business staffed by factory trained cutting tool specialists.

US PowerGrip



for No-Slip Drives

The U. S. PowerGrip "Timing"® Belt, a "U. S." invention, has been one of the true sensations in power transmission since it was patented eight years ago. Thousands of plants have converted drives to this more practical means of transmission. Its use has greatly increased the efficiency of industrial machinery and given rise to new appliances and original equipment by the score.

The "'Timing' Belt with Teeth" is known throughout industry as the "T" belt, a term as significant as the "V".

The U. S. PowerGrip "Timing" Belt gives positive, non-slip performance and requires no maintenance, no lubrication. And because this belt requires no appreciable tension at installation, it thereby prolongs bearing life. Your U. S. PowerGrip Transmission Distributor carries all stock sizes and can give you the benefit of his long experience in converting to the modern T.

• • •

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Mechanical Goods Division

United States Rubber

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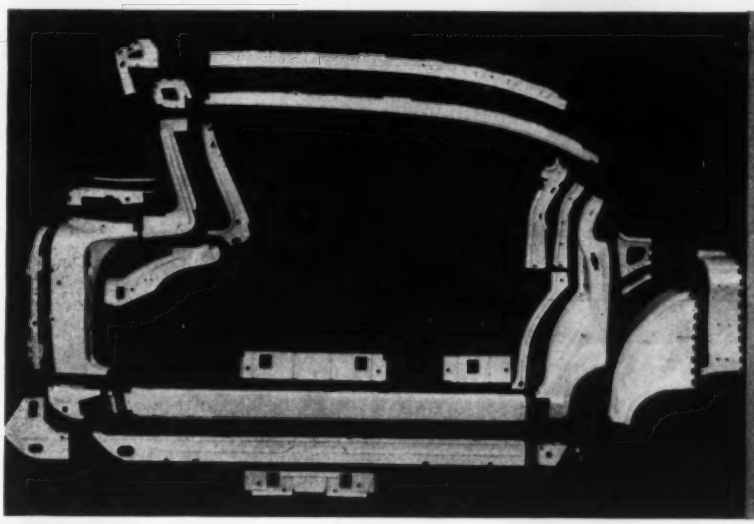
More Auto Glass . . .

Glass Area (sq in.)*

	Chevy	Cadillac
1959	4414	5205
1954	2986	4204

*4 door sedans.

Boosts Steel Use Here



Weight (lb in.)

	Chevy A Pillar	Cadillac Roof Rails
1959	0.174	0.139
1954	0.120	0.110

Gage

	A Pillar	Roof Rails
1959	0.075	0.047
1954	0.035	0.035

*Source: General Motors Corp.

EVERY TIME carbuilders announce another boost in total glass area in automobiles, someone is sure to exclaim that glass is pushing steel out the window. Actually, more glass requires more steel in body structural members.

Glass carries little of the structural load of the car, since it breaks when bent or twisted. The shatter-point of glass still is unpredictable. The ¼-in. laminated glass used in today's automobiles is about twice as heavy as the steel that supports it.

• **Stronger Supports** — The chart (above) shows how roof rails and windshield pillars have been beefed up to accommodate the greater expanse of glass in today's cars. The pillars don't look as large as they used to, but that's because heavier gages of steel permit smaller cross sections. Trim strips have been restyled to give a narrower appearance.

In addition, more of the load is being spread through the body into the cowl, door posts, and rocker panels, says Philip O. Johnson, engineer in charge of physical test lab at GM's Fisher Body Div. That is important. Mr. Johnson points out that the real key to good body structure is an efficiently designed

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side frame. Fisher Body side frames (see Page 63) contain 30 different structural members. Each contributes a bit to supporting the heavier windshield and backlights. Adds Mr. Johnson: "Although glass does not provide structural support for a car body according to static deflection tests, it does have a damping effect. It seems to absorb some of the road vibration."

• **Use Shifts** — While body parts have become heavier, roof panels have become lighter as windshields and backlights cut farther into the roof. Mr. Johnson says the 20 gage roof panels used on GM bodies are one-half to two-thirds the size they were five years ago. Fortunately for steelmakers, car bodies have become longer so the steel that once went into roof panels now is being used elsewhere in the body, mostly in quarter panels. Cold - rolled sheets are used for both roofs and quarter panels.

Ford offers a good example of this shift in steel. The 1954 Ford four door sedan had an over-all length of 198 in. and a 115 in. wheelbase. This year, Fords are 208 in. long and built on 118 in. wheelbases. As a result, Ford now uses 1610 lb of cold-rolled sheets per car, compared with 1460 lb just five years ago. Total glass area has increased from 3210 to 3655 sq in.

• **Future Cloudy**—Will glass ever replace steel as a structural member in cars? Not in the immediate future, believes Dr. Peter Kyropoulos, executive in charge of technical development in GM's styling staff. "While we have collected a lot of physical data on glass, we actually know very little concerning its structural behavior in particular situations. It's somewhat of an unpredictable material even though it's been around for centuries," he adds.

The glass industry ruefully agrees. Reports Dr. George B. Watkins, chairman of Libbey-Owens-Ford Glass Co.'s technical policy committee: "Glass, as manufactured today, fails to meet the dependable strength properties generally required of structural materials."

Both industries are experimenting with laminated plastics similar to those used by aircraft builders, but Dr. Kyropoulos points out that these materials have poor scratch resistance and are too costly. That punctures stylists' dreams of a bubble canopy even though several have been handmade for GM's Firebird turbine cars. "We know the glass people are not prepared to make bubbles out of laminated glass either," adds Dr. Kyropoulos. Another problem: Bubble tops will have to be vacuum coated with aluminum to reflect sun rays. Dr. Kyropoulos says manufacturers have not yet been able to develop volume production techniques that will coat large areas at a reasonable cost. Iron oxide tinting, apparently, won't be adequate for these larger areas.

• **Outlook** — Glass manufacturers have almost reached manufacturing limits in making compound curved windshields and backlights larger. Further increases will be small and mean only that more supporting steel will go into body structures. The growing use of unitized construction suggests that more of the load will be carried by body members below the belt line.

The next breakthrough that could concern steelmakers appears to be the development of laminated plastics that can be economically coated to filter sunlight, and will be strong and flexible enough to support a load without shattering. Such a material hasn't been developed. When it arrives, it will be several more years before practical manufacturing techniques are ready.

U. S. Auto Output

Passenger Only

	1959	1958
January	545,757	489,515
February		392,112
March		357,049
April		316,503
May		349,474
June		337,355
July		321,053
August		180,324
September		130,426
October		261,696
November		514,099
December		593,920
Total		4,243,526

Week Ended	1959	1958
Jan. 17	135,953	109,761
Jan. 24	126,843	107,495
Jan. 31	119,678	104,359
Feb. 7	114,282	109,028
Feb. 14	115,086†	101,656
Feb. 21	117,000*	89,977

Source: *Ward's Automotive Reports.* †Preliminary. *Estimated by STEEL.

Lifetime Ignition Readied

Electric Auto-Lite Co., Toledo, Ohio, reports it will market a transistorized ignition system this spring that will last for 100,000 miles without servicing. The system will retail between $70 and $80. It's aimed at the replacement market first, but may be picked up for original equipment installations.

Coils and condensers are eliminated in the Auto-Lite system, says George E. Spaulding, research director.

Auto Market Still Firm

Here's a roundup of the latest sales and marketing activities from Detroit.

• Studebaker-Packard Corp. says production of 1959 Larks and Hawks has surpassed 1958 output of 52,416 cars. S-P built 15,526 autos in January. As a result of increasing sales, the company has separated its truck and fleet sales departments. Lark fleet sales were 942 per cent greater during November, December, and January than last year. Imports are up too. Mercedes-Benz car sales were up 12 per cent in January over December's and 121 per cent above those in January, 1958.

• Domestic sales of Jeep vehicles during January were 37 per cent ahead of January a year ago, reports C. W. Moss, vice president and general sales manager of Willys Motors Sales Corp., Toledo, Ohio. Final figures for 1958 show Jeep sales for that year were 11 per cent above 1957's, despite an industry-wide sales slump of 25 per cent.

• Ford Div. reports that cumulative sales and current back orders for its four passenger Thunderbird are more than 65,000, which is 22 per cent greater than the total three year production run of the two seat T-Bird. The 25,000th 1959 model Thunderbird was built last week. Production is 25 per cent ahead of last year's rates. Hardtop styles are accounting for 92 per cent of all T-Bird output.

Gets 40% savings in coolant costs by change to

Standard's Transparent Coolant

ARGON Oil No. 4

Chicago Saws, Inc., realizes other benefits in switch to this Standard Oil product

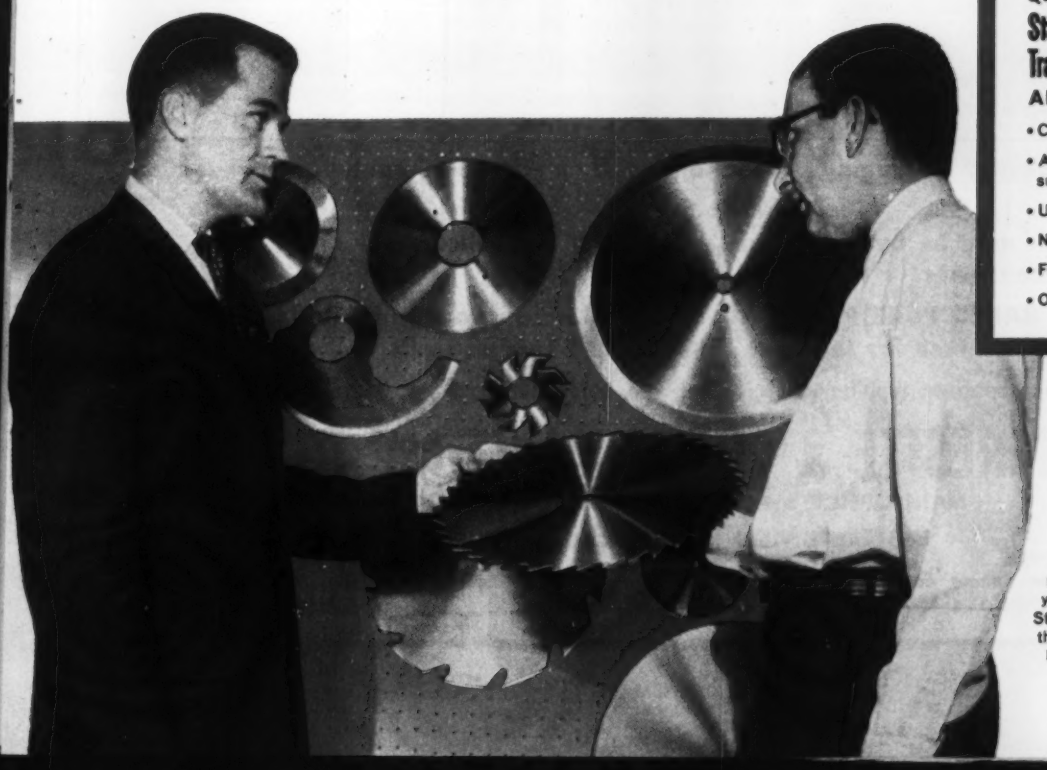
Situation: It all started when a Standard Oil lubrication specialist recommended ARGON Oil No. 4, Standard's transparent coolant to Chicago Saws for use in their grinding operations. This manufacturer of rotary saw blades decided to give it a try. They knew the product was the result of more than three years' work in Standard's research laboratory, and that it had been extensively field tested.

What happened: Using ARGON Oil No. 4 in 100:1 concentration, Chicago Saws was able to reduce coolant costs 40%. They also found the work could be seen more clearly when using this coolant. There was less wheel loading. They also discovered the coolant didn't foam and that its exceptional ability to carry off heat resulted in cooler operation. Faster cuts were obtained with finer wheels. Tolerances were easier to hold. Better finishes were obtained. Less frequent wheel dressings were required.

What you can do: Get more information about ARGON Oil No. 4 transparent coolant. Call the Standard Oil lubrication specialist near you in any of the 15 Midwest or Rocky Mountain states. Or write: **Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.**

Using ARGON Oil No. 4, Chicago Saws gets better finish at savings of 40% over other coolants tried. Operator is using .004" cut on heat treated Rockwell 60 C steel.

You expect more from STANDARD *and you get it!*



Quick facts about

Standard's Transparent Coolant

ARGON Oil No. 4

- Clear, transparent fluid
- All chemical. Does not support bacteria growth
- Unaffected by humidity
- Nonfoaming
- Fire resistant
- Odorless

Standard's Bob Stark and Chicago Saws' vice president Paul Bostrom discuss blades and coolants. Bob Stark is well qualified to work with manufacturers on the use of metalworking coolants. Bob has a chemistry degree from Illinois College plus three years' experience at Standard. He has completed the Standard Oil Sales Engineering School course.

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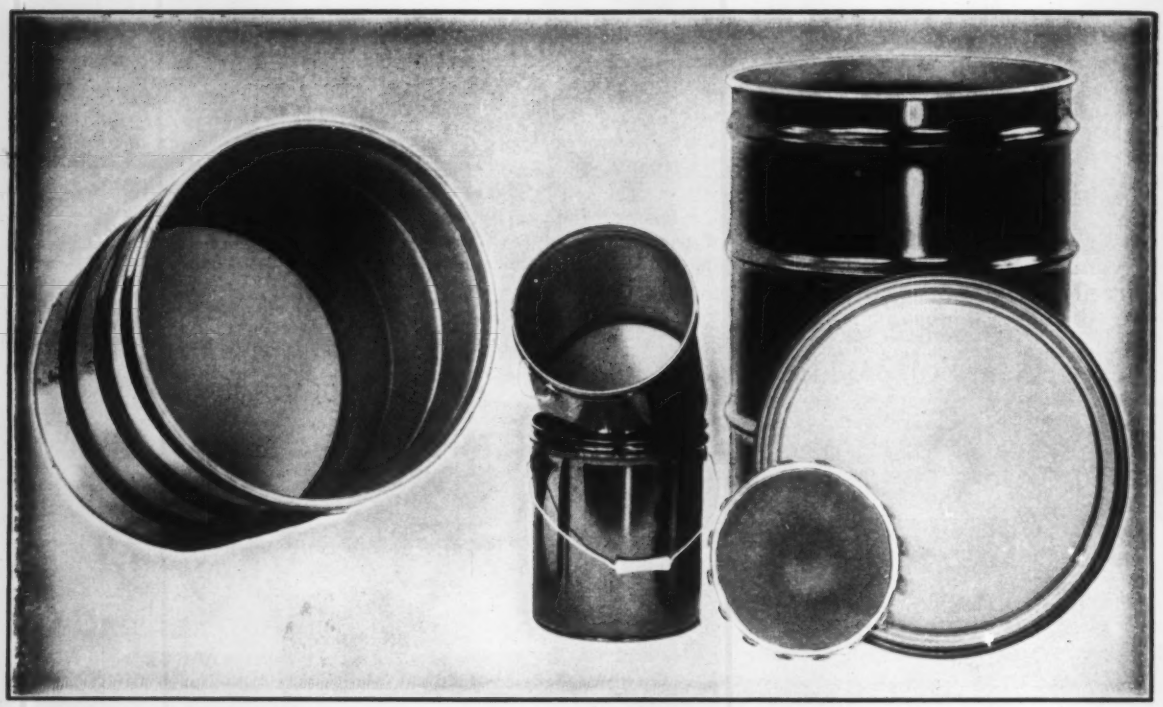
PACKAGE AND SHIP YOUR PRODUCTS IN STEEL CONTAINERS—HERESITE LINED



For unsurpassed packaging protection insist on HERESITE baked pure phenolic linings.

Application may be by cold spray, hot spray, or roller coat on any size or shape of container.

HERESITE BAKED PURE PHENOLIC LININGS are approved by the U. S. Department of Agriculture for lard and other edible fats and oils.

Your shipping container supplier will give you the details or write for the latest booklet to:

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Canada: Dominion Rubber Company, Ltd.
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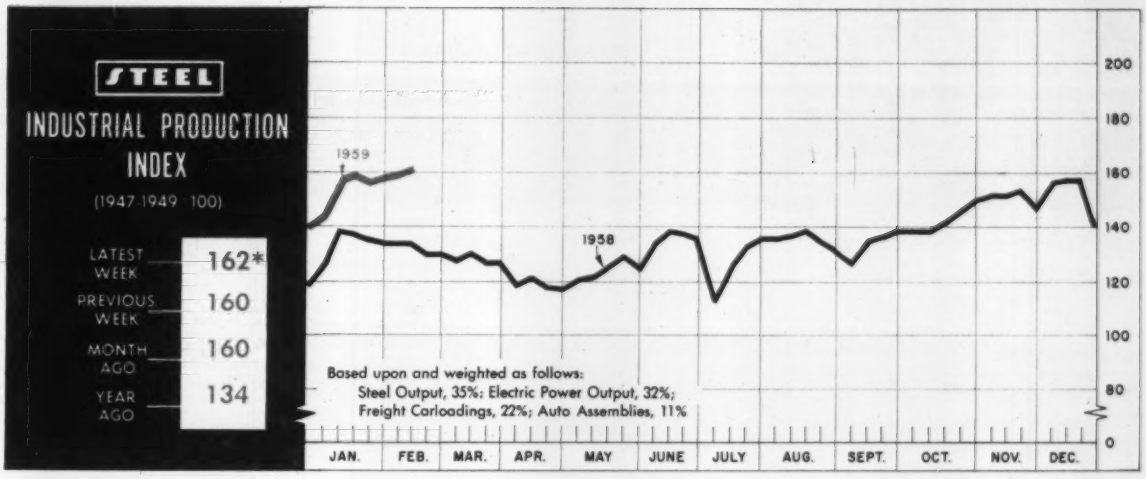

*Week ended Feb. 14.

Lagging Indicators Start Upturn

THIS week, three important signposts indicate that the recovery from the recession of 1958 is nearly complete.

• **Barometers Turn Up**—All but nine of the 30 segments of importance to metalworking (reported periodically in charts on the following two pages) have turned up from their low points and are keeping pace with the over-all recovery. Of the nine which haven't, most will make the grade this quarter.

• **FRB Index Climbs**—The seasonally adjusted industrial production index of the Federal Reserve Board made its ninth consecutive gain during January, nearly reaching the prerecession peak.

• **STEEL's Index Jumps**—This magazine's unadjusted production index (above) broke out of its five week plateau and advanced to within 6 percentage points of its all-time high.

Statistical Picture Brightens

Of the nine lagging segments, the broadest in scope (employment), is the slowest to regain its late 1957 form. As the chart on Page 68 shows, the only major segment of metalworking which had more production workers last month than in the corresponding 1958 period was electrical machinery.

J. W. Vanden Bosch, business analyst for the Cleveland Chamber of Commerce, reports payrolls in his area have climbed about one-third of the way back to the top. But long leadtime, heavy industries have failed to share in the gains. Rehiring is on a selective basis. The 40 hour week is prevalent for the first time since September, 1957. But Mr. Vanden Bosch doubts that a return of production to 1957 levels will produce a corresponding increase in employment.

De Ver Sholes, of Chicago's Association of Commerce & Industry,

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1,000 net tons)[2]	2,439[1]	2,371	1,373
Electric Power Distributed (million kw-hr)	13,300[1]	13,292	12,417
Bituminous Coal Output (1,000 tons)	8,310[1]	8,550	7,460
Crude Oil Production (daily avg—1,000 bbl)	7,150[1]	7,213	6,852
Construction Volume (*ENR*—millions)	$346.2	$284.2	$208.7
Auto, Truck Output, U. S., Canada (*Ward's*)	149,774[1]	148,328	128,751
TRADE			
Freight Carloadings (1,000 Cars)	560[1]	565	533
Business Failures (Dun & Bradstreet)	271	322	342
Currency in Circulation (millions)[3]	$31,193	$31,121	$30,675
Dept. Store Sales (changes from year ago)[3]	+9%	+8%	−8%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$22,313	$25,024	$18,832
Federal Gross Debt (billions)	$285.6	$285.8	$274.5
Bond Volume, NYSE (millions)	$30.6	$31.7	$22.0
Stocks Sales, NYSE (thousands of shares)	14,793	16.141	10,003
Loans and Investments (billions)[4]	$94.9	$95.2	$87.1
U. S. Govt. Obligations Held (billions)[4]	$32.0	$32.1	$26.3
PRICES			
STEEL's Finished Steel Price Index[5]	247.82	247.82	239.15
STEEL's Nonferrous Metal Price Index[6]	217.3	218.8	201.0
All Commodities[7]	119.4	119.3	118.8
Commodities Other than Farm & Foods[7]	127.6	127.5	125.8

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1959, 2,831,486; 1958, 2,699,173. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-39=100. [6]1936-39=100. [7]Bureau of Labor Statistics Index, 1947-49=100.

"Samson" Shot
(chilled iron)
"Angular" Grit
ANGULAR GRIT
AMERICA'S LEADING METAL ABRASIVES
The four most famous names in metal abrasives provide a size and type of shot or grit to meet every blast-cleaning need. Write for literature and recommendations.
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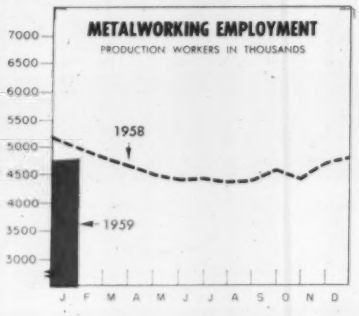
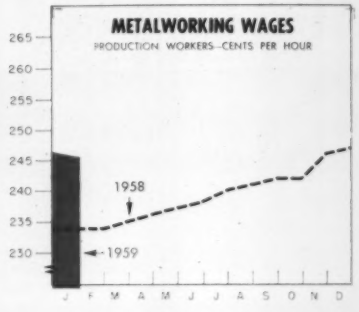
Arch Lightbody is one of 800,000 Americans cured of cancer because they went to their doctors in time. They learned that many cancers are curable if detected early and treated promptly. That's why an annual health checkup is your best cancer insurance.

American Cancer Society





1958	Prim. Mtls.	Fab. Prod.	Mach- inery	Elec. Mchy.	Trans. Equip.
Jan.	958	840	1,134	793	1,267
Feb.	913	806	1,109	767	1,207
Mar.	885	787	1,090	749	1,153
Apr.	849	766	1,061	729	1,103
May	840	756	1,029	715	1,081
June	859	773	1,014	716	1,084
July	852	765	990	712	1,063
Aug.	864	788	977	734	1,034
Sept.	898	822	1,007	762	1,100
Oct.	899	791	1,005	746	992
Nov.	926	827	1,020	788	1,199
Dec.*	945	824	1,042	795	1,208
1959					
Jan.*	944	818	1,053	801	1,212

*Preliminary.
U. S. Bureau of Labor Statistics.
Charts copyright, 1959, STEEL.

1958	Prim. Mtls.	Fab. Prod.	Mach- inery	Elec. Mchy.	Trans. Equip.
Jan.	256	222	234	212	246
Feb.	256	222	235	213	246
Mar.	257	223	236	214	247
Apr.	258	224	236	214	247
May	258	225	237	214	249
June	261	227	238	215	250
July	268	228	238	215	253
Aug.	270	229	238	214	255
Sept.	272	229	239	216	255
Oct.	274	228	240	215	255
Nov.	275	231	242	218	263
Dec.*	275	233	244	219	266
1959					
Jan.*	275	233	244	220	260

*Preliminary.
U. S. Bureau of Labor Statistics.

reports similar conditions in that area. Its manufacturing employment gained about 50,000 workers between May and December, but the payroll is still 120,000 below the September, 1957, mark. He estimates that the FRB Index will have to surpass 150 (1947-49 = 100) before full employment returns.

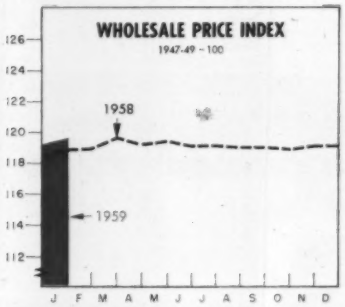
• **Structural Steel**—Fabricators are waiting for an upturn in industrial construction before they become too optimistic, says the American Institute of Steel Construction. But until then, steady increase in highway and other government building will continue to support moderately heavy orders and shipments. Orders in the last half of 1958 ran considerably ahead of those for the corresponding period of 1957, but heavier shipments prevented backlogs from increasing.

• **Gears**—After staging a rally during the fall, gear sales dropped unexpectedly to the third lowest point of the year in December. But John C. Sears, executive director of the American Gear Manufacturers Association, says members are more confident than they were last year and anticipate a 5 to 10 per cent gain over 1958's sales. Small and medium sized speed reducers are providing the punch now, he says.

• **Castings**—Among founders, gray iron people are the most optimistic. They see a continuation of the upturn that started in the fourth quarter of 1958, with monthy shipments hitting 1 million tons last month. The industry is operating at about 70 per cent of its capacity (average monthly shipments during first six months of 1951). Don Workman, executive vice president of the Gray Iron Founders Society, forecasts a 12 million ton year for the industry, compared with about 10.3 million tons last year.

F. Kermit Donaldson, executive vice president of the Steel Founders' Society of America, feels that his industry is on the uptrend. January bookings exceeded shipments by about 7 per cent, building up the backlog. February looks equally good. Railroads have entered the market to a degree, but the improvement is pretty general, he believes. Shipments should show a corresponding gain in February.

Malleable founders are not so optimistic. They are getting more orders from the construction industry and farm machinery makers, but they see little life in railroads.



	All Commodities 1959	All Commodities 1958	Other Than Farm & Foods 1959	Other Than Farm & Foods 1958
Jan.	119.5	118.9	127.5	126.2
Feb.	....	119.0	....	125.7
Mar.	....	119.7	....	125.7
Apr.	....	119.3	....	125.5
May	....	119.5	....	125.3
June	....	119.2	....	125.3
July	....	119.2	....	125.6
Aug.	....	119.1	....	126.1
Sept.	....	119.1	....	126.2
Oct.	....	119.0	....	126.4
Nov.	....	119.2	....	126.8
Dec.	....	119.2	....	127.2

U. S. Bureau of Labor Statistics.

	1958	1957	1956	1955
Jan.	93.07	126.34	122.43	97.00
Feb.	93.49	139.29	129.56	98.71
Mar.	97.89	140.76	166.14	149.16
Apr.	122.36	132.67	145.20	109.52
May	118.04	157.95	155.53	110.50
June	131.15	121.57	189.13	139.00
July	134.34	128.31	165.50	111.76
Aug.	104.46	110.09	168.70	106.20
Sept.	85.41	116.79	130.35	136.80
Oct.	111.35	124.80	143.38	123.52
Nov.	110.88	87.80	138.50	118.09
Dec.	105.97	105.65	117.76	139.85
Avg.	109.87	124.34	147.68	120.01

Material Handling Institute Inc.

• **Machine Tools**—Orders in January were at about the same level as they were in December (1958's best month). Shipments are holding steady as builders attempt to keep backlogs at or above the three month level. However, shipments should move up some as the quarter progresses if orders continue to firm up. But it will be a long time before business builds back up to the 1956-57 level.

• **Radio and TV**—Output of auto and home radio sets in January topped 1.1 million units, making one of the fastest starts for any year on record. TV set output last month was about 440,000 units, nosing out the corresponding 1958 total but 10,000 units under the January, 1957, figure. Higher priced radio and phonograph units (hi-fi) are selling well.

• **Resistance Welders** — Shipments in January apparently held at December's level, which wasn't particularly good. But orders took a healthy jump, indicates an estimate made by the Resistance Welder Manufacturers Association. "There are an awful lot of inquiries, but firm orders are hard to get," states R. Bruce Wall, secretary-treasurer, of the association. Backlogs are increasing, he says.

Indexes Near Peaks

The general upturn, plus the strong showing of the steel industry last month, helped advance the FRB index one more point to 143 (1947-49 = 100), only 3 percentage points away from the all-time high. The biggest gain was in nondurable goods, which rose to a record last month. Durable goods gains were held down by bad weather and lower auto production, especially at Chrysler Corp. With the end of the glass shortage, production should increase 5000 to 10,000 units a week, but it is probably too late to make much difference in the February index figure. But the continued increase in steel production should insure another stepup in February's total production figure.

As the result of the best output in nearly two years by the steel industry, STEEL's industrial production index moved to a preliminary 162 (1947-49 = 100) for the week ended Feb. 14. This is the highest level for the trend line since the week ended Mar. 2, 1957. With increased auto output and rail shipments, the trend should continue.

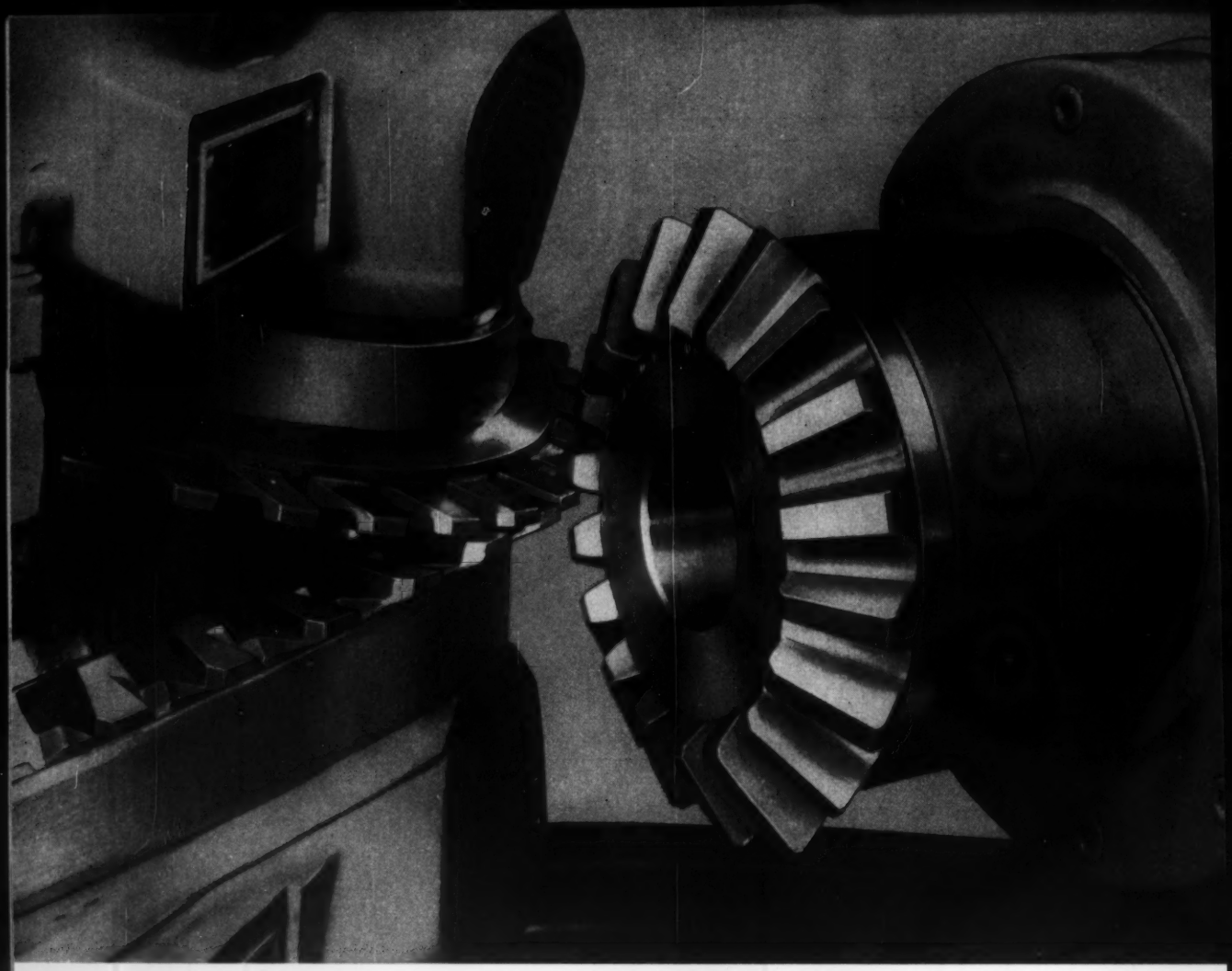
25,000:1 This fantastic ratio is possible only at Somers, where the latest equipment produces thin strip down to .001", as wide as 25".

With the installation of one of the largest Sendzimir mills in the non-ferrous industry, Somers is prepared to meet the broadest range of dimensional specifications, since it is already supplying thin strip down to .0001" in narrower widths.

Pure Nickel, Monel, Inconel and Inconel "X" are produced in gauges from .0001" to .020". Stainless Steel, electrolytic Copper and its alloys, such as Brass, Nickel Silver and Phosphor Bronze from .0001" to .010".

For a complete survey of your strip problems at no cost or obligation, write for field engineer or Confidential Data Blank.

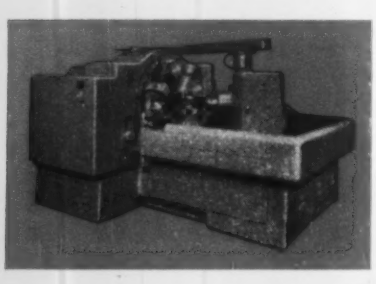
Somers Brass Company, Inc.
104 Baldwin Ave. Waterbury, Conn.



How to complete gears up to 16" O.D. in one cut from the solid

The Gleason No. 114 Straight Bevel Coniflex® Generator cuts gears directly from the solid in diameters up to 16", up to 2½" face width and 2½ diametral pitch.

With it you obtain much faster production rates—up to five times faster than with other methods. Still it retains a basic flexibility which permits quick changeovers from one job to another.



Excellent quality. Even with the speed of the No. 114 Coniflex Generator, quality remains excellent. It provides a smooth blend of root, fillet, and tooth flank—your assurance of strong, accurate teeth.

Coniflex gears give localized tooth bearing, too, assuring practical assembly tolerances.

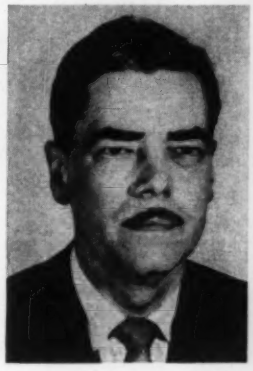
Simplified calculations. You can do all calculations with a slide rule. You can also control tooth bearing easily to suit various operating conditions or to set up interchangeability with existing gears.

For more details on the No. 114, write for bulletin.

GLEASON WORKS

1000 UNIVERSITY AVE., ROCHESTER 3, N.Y.

DONALD E. SMILEY
Pico Precision president



TOM G. CONWAY
Pesco Products v. p.-mfg.

D. F. GRIFFIN
Landis Machine metallurgist

FRANK H. DAY
Victoreen standards mgr.

Donald E. Smiley was named president, **Pico Precision Products Co.**, Pico, Calif., subsidiary of Pendleton Tool Industries Inc. He succeeds **Roger H. Stokes**, resigned. Mr. Smiley was vice president-manufacturing, Weber Showcase & Fixture Co.

Tom G. Conway was appointed vice president - manufacturing, **Pesco Products Div.**, Bedford, Ohio, Borg-Warner Corp. Prior to joining Pesco in 1958, Mr. Conway was director of manufacturing services at Borg-Warner. He previously was with Lycoming Div., Avco Corp., as general works manager.

Pfaudler Permutit Inc., Rochester, N. Y., transferred Vice President **George C. Calvert** to Rochester to supervise its western hemisphere operations outside the U. S., and to assist in supervising other foreign operations. He was manager of the Elyria, Ohio, plant of Pfaudler Co., a division, and is succeeded by **Thomas Griswold**, former assistant plant manager. **E. W. Zoller** was made manager of domestic manufacturing operations for the Pfaudler Div. **H. R. Derleth** was made assistant plant manager at Rochester.

Albert J. Booth was made manager of the Bridgeport, Conn., plant, **Stewart Die Casting Div.**, Stewart-Warner Corp. He succeeds the late **George Wilder**. He was president of Booth Products Inc. **James C. Bell**, former chief engineer of the Bridgeport diecasting plant, was promoted to superintendent of production and engineering.

D. F. Griffin was appointed chief metallurgist, **Landis Machine Co.**, Waynesboro, Pa. He was formerly with Vanadium-Alloys Steel Co.

M. E. Carroll, general sales manager, **Minneapolis-Moline Co.**, Hopkins, Minn., was elected to the new office of vice president-marketing. **Roger R. Hipwell**, previously product manager and advertising manager, was named sales manager-Industrial & OEM Div. **W. L. Pringle**, manager of the Hopkins Sales & Service Div., was named sales manager, Farm Machinery Div.

Jay W. Stranahan was made sales manager; **Fred C. Kemmerling**, operations manager for Chicago Steel Service Co., Chicago. Mr. Stranahan was district manager in the Minneapolis-St. Paul area.

Toledo Pipe Threading Co., Toledo, Ohio, appointed **John Harkness** director of purchases to succeed **Herbert Miller**.

William F. May was elected a vice president in the executive department of **American Can Co.**, New York. He was assistant to the vice president in charge of Canco Div. sales.

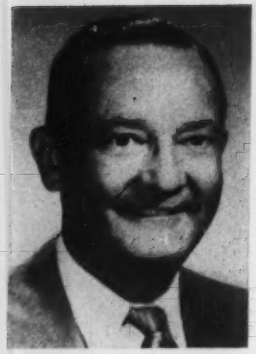
Automatic Transportation Co., Chicago, appointed **P. K. Tremewen** director of customer service; **P. H. Powers Jr.**, production manager; **O. A. Northstrum Jr.**, general superintendent; **J. A. Burik**, director of industrial engineering; **B. H. Younker**, manager of the Government Contracts Dept.

Frank H. Day was appointed radiological physicist and head of the Nuclear Standards Dept., **Victoreen Instrument Co.**, Cleveland. He was with the National Bureau of Standards, in charge of gamma and x-radiation calibrations.

Acoustica Associates Inc., Mineola, N. Y., and Los Angeles, organized separate eastern and western divisions. **Gerald M. Henriksen** was named executive vice president, in charge of all divisions. He was vice president-director of engineering. **Ralph Reynolds**, a vice president, was made general manager, Eastern Div.; **Frank P. DeLuca**, a vice president, was named general manager, Western Div. **Stanley R. Rich** was elected vice president of Acoustica, and continues as president of General Ultrasonics Co., subsidiary at Hartford, Conn.

Howard B. Upham was named Cincinnati district manager, **Pratt & Whitney Co. Inc.** He replaces **James H. Daley**, recently made domestic sales manager, Machine Tool Div. **Arthur LaDucer** was named district sales manager of machine tool sales for the Cincinnati territory.

Thompson Ramo Wooldridge Inc. elected four operating executives of the Thompson Products divisions in Cleveland to vice presidencies: **Pierce T. Angell**, engineering manager of the Tapco Group; **Robert E. Cummings**, manager of the Thompson Products Valve Div.; **William M. Jones**, manager of the Thompson Products Commercial Electronics Group; **Carl L. Kahlert**,



DR. CHRIS A. STIEGMAN
Hooker Chemical promotion

NORMAN F. SPOONER
Hoskins Mfg. research mgr.

CHARLES F. McKENNA Jr.
Johnson & Hoffman president

JAMES P. GANTLEY
heads Fenn nuclear div.

manager of the Thompson Products Replacement Div.

Dr. Chris A. Stiegman was promoted to director of research for **Hooker Chemical Corp.**, Niagara Falls, N. Y. He is in charge of all research at the corporate level, embracing both chemical and plastics.

Frederick J. Keller was made assistant sales manager, **Whitman & Barnes**, Plymouth, Mich. He was sales director, American Saw & Tool Co. and subsidiaries.

Nooter Corp., St. Louis, promoted **Robert H. Nooter** from assistant to the president to vice president-operations; **Ralph Ecoff** from chief engineer to vice president-chief engineer; **Herbert H. Lurtz** from purchasing agent to director of purchases. **Ernest E. Worthington** was made vice president and manager of field sales and construction. **Paul T. Dowling, Philip H. Smith,** and **Lawrence E. Foster** were made vice presidents-division sales managers.

Norman F. Spooner was promoted from supervisor to manager of research and development for **Hoskins Mfg. Co.**, Detroit.

Charles F. McKenna Jr. was elected president, **Johnson & Hoffman Mfg. Corp.**, Mineola, N. Y. He succeeds **Jay H. Johnson,** resigned. Mr. McKenna was treasurer of Johnson & Hoffman, subsidiary of Superior Tube Co. of which he was at one time director of purchases.

Joseph A. Ackermann was named sales manager; **John A. Draxler,** chief engineer, **Elwell-Parker Electric Co.**, Cleveland.

Columbia-Geneva Steel Div., San Francisco, U. S. Steel Corp., appointed **Charles C. Morgan** general superintendent of its Geneva Works near Provo, Utah, to succeed **A. E. Terry**, who retires this month. **George A. Jedenoff** succeeds Mr. Morgan as general superintendent of the Pittsburg, Calif., Works. He was assistant general superintendent.

Fenn Mfg. Co., Newington, Conn., formed a Nuclear Products Div., and appointed Vice President **James P. Gantley** in charge of all internal nuclear division operations; Vice President **A. T. Scattergood** to supervise field contact and engineering.

Robert E. Harvey was elected president, **Merritt-Chapman & Scott Corp.**, New York. He was senior executive vice president. He succeeds **Louis E. Wolfson,** chairman, who continues as chief executive officer, with Mr. Harvey assuming operational responsibility.

Joseph LaBarbera was promoted from production manager to vice president - manufacturing, **J. B. Beaird Co. Inc.**, Shreveport, La.

Kenneth S. Hargie was made sales manager, **Humphrey Products Div.**, General Gas Light Co., Kalamazoo, Mich.

Howard Carson was elected vice president, **Cadillac Gage Co.**, De-

ROBERT H. NOOTER

RALPH ECOFF

Nooter Corp. vice presidents

CHARLES C. MORGAN

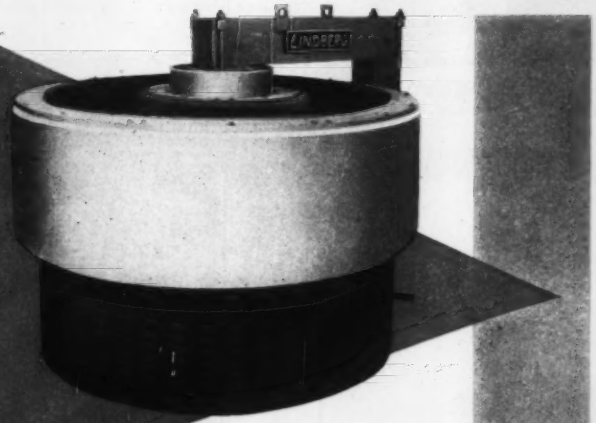
GEORGE A. JEDENOFF

superintendents of Columbia-Geneva works

Two good names join . . .

LINDBERG UPTON

for better service in salt bath furnaces



Lindberg Induct-O-Ring, first electric production salt bath furnace, that can be shut down overnight and regain operating temperature quickly. Rotary action provides positive quality control.

A complete line of high and low temperature salt bath furnaces for any production, pilot plant or laboratory use is now available from Lindberg. This line includes not only Lindberg equipment, but, by joint agreement, the complete line of Upton Salt Bath Furnaces, manufactured by Upton Electric Furnace Company, Roseville, Michigan.

This combination of Lindberg, with its long experience in all types of industrial heating equipment and Upton, leading specialists in salt bath furnaces, will provide industry with more efficient service in the important salt bath furnace field.

Lindberg and Upton engineers and technical staffs are available to assist you in applying salt bath furnace techniques most efficiently to your production processes. Just get in touch with your nearest Lindberg Field Representative (see your local classified phone book) or write us direct. Salt Bath Furnace Division, Lindberg Engineering Company, 2441 West Hubbard Street, Chicago 12, Illinois. Los Angeles plant: 11937 South Regentview Avenue, at Downey, California.

Upton aluminum dip brazing Salt Bath Furnace featuring Continuing Graphite Electrodes. Installation in plant manufacturing industrial heat exchangers. Note insulated chamber over salt bath.

This line of Upton Salt Bath Furnaces, in use in a commercial heat treating plant, handles all types of steel heat treating including high-speed steel tools and parts.

Upton deep submerged electrode Salt Bath Furnace. Available in depths and lengths up to 40 feet or more.

Continuing Graphite Electrodes, an exclusive Upton feature, eliminate bath contamination and provide exceptional savings in electrode costs over conventional, overhanging metal electrodes.

OTTO W. HEIN JOSEPH E. HARTFORD ROBERT F. VOKES

management changes at Black-Clawson Co.

GORDON J. DUERR GEORGE E. FRANCK FRED W. WINTER

Imperial Brass Mfg. vice presidents

troit, and general manager of the Costa Mesa operation.

Imperial Brass Mfg. Co., Chicago, elected three vice presidents: **Gordon J. Duerr**, vice president-marketing; **George E. Franck**, vice president-engineering and research; **Fred W. Winter**, vice president-manufacturing.

Beauchamp E. Smith was elected a vice president, **Allis-Chalmers Mfg. Co.**, Milwaukee. He is general manager, Hydraulic Div.

A. T. Forrest was made chief engineer at **Crucible Steel Co. of America's** Midland, Pa., Works. He succeeds the late **J. K. Watkins.**

George H. Greene succeeds the late **A. J. Fisher** as general manager of **Bethlehem Steel Co.'s** Johnstown, Pa., plant.

James W. Swaine was made vice president, **General Chemical Div.**, Allied Chemical Co., New York, in charge of research, engineering, and construction. He succeeds **James G. Fox Jr.**, who transferred to the National Aniline Div. as executive vice president in November. **Dr. Howard H. Hurmence** was made technical director, General Chemical Div.

H. Maurice Banta was appointed assistant director, research and technology, for U. S. Steel Corp.'s **National Tube Div.**, Pittsburgh. He was a research associate at Battelle Memorial Institute.

John E. Newlin Jr., former manager of tool steel sales for **Carpenter Steel Co.**, Reading, Pa., was named to the new post of general manager, sales service. He is succeeded by **T. Allen Washburn.**

Thomas H. Thomson was appointed acting manager of purchasing, **Martin Steel Corp.**, Mansfield, Ohio. **Charles R. Oberlin** was made manager of production control and scheduling.

Joseph P. Fagan was made director of industrial relations at **Firth Sterling Inc.**, Pittsburgh.

Black-Clawson Co., New York, announces management changes to be effected in stages and completed in September. **Otto W. Hein**, vice president, advances from general manager, Paper Machine Div., Watertown, N. Y., to the corporate staff in charge of co-ordination of over-all company production, capital investments, and industrial relations. **Joseph E. Hartford**, vice president, transfers from general manager, Shartle Div., Middletown, Ohio, to general manager, Paper Machine Div.; **Robert F. Vokes**, vice president-administration, New York, transfers to the Shartle Div. as general manager. **Carl C. Landegger**, assistant general manager, Paper Machine Div., was made administrative vice president, New York. **Samuel T. Weber** was elected a vice president and remains as sales manager, Paper Machine Div.

Albert M. Cole, who recently resigned as federal housing administrator, joined **Reynolds Aluminum Service Corp.**, Richmond, Va., subsidiary of Reynolds Metals Co., as executive vice president.

Aluminum Co. of America, Pittsburgh, appointed **Keith K. Reid** assistant to the manager of sheet and plate sales. He will co-ordinate manufacturing and marketing of the company's new Alply panels.

C. R. Conklin was promoted to assistant general sales manager, **Republic Rubber Div.**, Youngstown, Lee Rubber & Tire Corp. He succeeds **J. M. Hughes**, who resigns Mar. 1.

OBITUARIES...

Cletus V. Briner, manager, Gage Div., **Pipe Machinery Co.**, Cleveland, died Feb. 10.

Henry W. Campbell, 60, chief engineer, **Interlake Iron Corp.**, Cleveland, died Feb. 9.

John D. Zahn, 50, control officer for the metal operations group of **Continental Can Co.**, New York, died Feb. 4.

John E. Taylerson, 43, manager of engineering service, **Linde Co.**, division of Union Carbide Corp., New York, died Feb. 4.

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when you standardize on

BOSTON GEARS

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STANDARDIZED TRANSMISSION PRODUCTS

Stock Gears
Sprockets and Chain
Speed Reducers
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The BOSTON Gear catalog lists over 2000 types and sizes of standardized gears. It is your reliable guidebook to transmission design and maintenance economy. Select the gears you need, then order from your nearby BOSTON Gear Distributor — for prompt delivery from stock.

BOSTON Gears are top-rated for precision and performance by industry's most experienced buyers. Installed in your product, they simplify servicing problems. If required, replacements are available anywhere, from over 100 conveniently located Distributors.

Why pay more (and wait) for "special" gears? Boston Gear Works, 73 Hayward St., Quincy 71, Mass.

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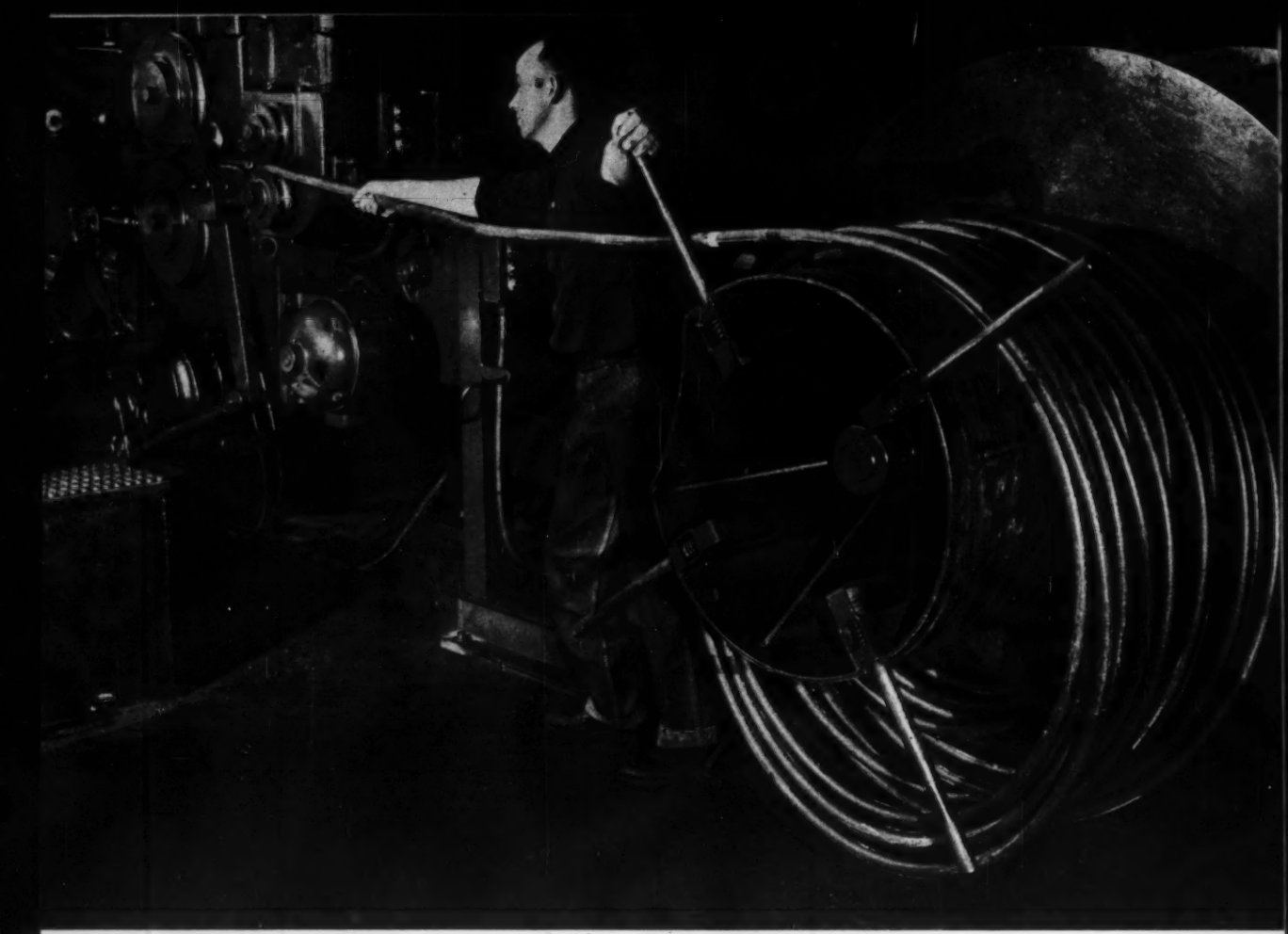


"New large coils of J&L hot rolled bars permit longer production runs"

. . . states industrial fastener manufacturer

"Use of large coil weights in J&L hot rolled bars enables us to increase production through longer runs, reduced machine downtime," reports Mr. Robert McCombs, General Manager of Russell, Burdsall & Ward's Coraopolis, Pa., plant.

"We are able to cold form ¾" heavy hexagon nuts, 1¼" across the flats, from J&L's C-1110 scrapless nut quality bars, without surface cracks, at high speed. This is a severe test of hot rolled steel quality."

R. B. & W., one of the oldest and largest manufacturers of industrial fasteners, uses J&L steel in both low and medium carbon grades as well as the C-1110 steel.

Investigate J&L's superior quality hot rolled bars for your toughest cold forming applications. Bars are now available in coil weights up to 1300 pounds.

Call in a J&L steel specialist for recommendations on how to improve physical characteristics of your end products and to increase your production rate. Write Jones & Laughlin Steel Corporation, 3 Gateway Center, Pittsburgh 30, Pennsylvania.

J&L C-1110 scrapless nut quality hot rolled bars, 1 9/32" diameter, are used in producing these R. B. & W. nuts, 1¼" across the flats, with ¾" tapped diameter.

Jones & Laughlin Steel Corporation

STEEL

PITTSBURGH, PENNSYLVANIA

Sylvania, General Telephone Unite

Consolidated organization will have assets of about $1,850,000,000 and will produce almost a thousand products for industry, national defense, and the home

MERGER of Sylvania Electric Products Inc. into General Telephone Corp. has been approved. The new corporate name is General Telephone & Electronics Corp., with Sylvania operating as a separate, wholly owned subsidiary.

Sylvania is among the leading companies in electronics, lighting, television-radio, photography, and chemistry-metallurgy. Advantages of the consolidation to it include: Increased ability to finance future development, further diversification of products resulting from research efforts of the combined companies, availability of General's experience in foreign manufacturing and sales, and financial stability afforded by telephone operations of General.

For General Telephone, the merger provides increased diversification of investment, increased research and development facilities, and a source of knowhow in areas of electronic development which may prove of importance to the communications industry generally.

• **Areas of Activity**—Sylvania is engaged in multimillion dollar defense projects involving research, development, and production activities in such fields as electronic countermeasures, counter-countermeasures, weapon and missile systems, data processing, communications, radar, navigation and control systems.

General Telephone is the nation's largest independent telephone company and has second largest communications system. It has a research division and several manufacturing units, producing equipment for the transportation, communications, and other industries. General has several manufacturing units in Europe and Canada, as well as operating companies in Canada, the Philippines, and the Dominican Republic.

Donald C. Power, president of General Telephone, becomes chairman and chief executive officer of the combined corporation. Don G. Mitchell is president of the parent corporation and chairman of the Sylvania subsidiary.

Rheem, Thermovac Tied

Rheem Mfg. Co., Chicago, has acquired a major interest in Thermovac Inc., Stockton, Calif., manufacturer of food processing equipment. E. F. Paquette, vice president and general manager of Rheem's Container Div., will be chairman; Frank A. Bellato will continue as president of Thermovac.

Builds Electric Melt Shop

Deliveries of structural steel for a plant being built on Joe Orr Road, Chicago Heights, Ill., for Calumet Steel Div., Borg-Warner Corp., are beginning. The building will house Calumet's electric melt shop. Luria Engineering Co., New York and Bethlehem, Pa., is fabricating the steel, while Rust Engineering Co., Birmingham, is engineer and project manager.

Buys Air Compressor Line

Scaife Co., Pittsburgh, a subsidiary of Wilson Bros., New York, is acquiring the air compressor product line of the Kellogg Div., American Brake Shoe Co., Rochester, N. Y. Scaife produces pressure vessels, and rocket and missile components. Kellogg will continue to make aircraft hydraulic pumps and components.

Permaglas Div. Expands

A. O. Smith Corp., Kankakee, Ill., has completed a $5 million program for expansion and modernization of production facilities for its Permaglas Div., which makes glass lined water heaters, storage tanks. heating and cooling equipment, and water softeners. Expenditures included $550,000 for an office addition, $115,000 for a warehouse, $105,000 for research and test facilities. The project also covered modernizations and additions to manufacturing plants, acquisition of a water softener plant in Omaha, Nebr., and a water heater production plant in another marketing area.

Offers Vacuum Castings

Sigourney Mfg. Corp., South Acton, Mass., is producing investment castings, employing vacuum metallurgy. Glass-ceramic investments are combined with vacuum casting in the high vacuum system of induction heating.

Ferry Cap Lifts Capacity

Ferry Cap & Set Screw Co., Cleveland, has installed two highly automated machines to turn out special fasteners and cold forged products. The machines, made by National Machinery Co., Tiffin, Ohio, represent an investment of more than $250,000.

Forms Nuclear Power Dept.

Allis-Chalmers Mfg. Co., Milwaukee, changed the name of its Nuclear Power Div. to Atomic Energy Div. R. M. Casper is general manager of the division. The firm also has formed a Nuclear Power Dept. that is responsible for the division's activities in the nuclear fission field.

Bridgeport To Build

Bridgeport Brass Co., Bridgeport, Conn., will build a 65,000 sq ft plant in Moultrie, Ga., to make tubular plumbing goods. Equipment will include facilities for machining, annealing, polishing, and chrome plating.

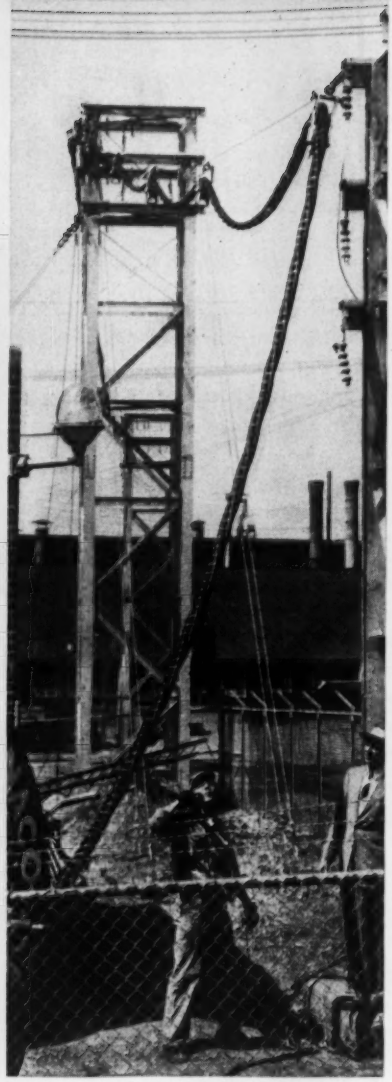
Michigan Drill Renamed

Michigan Drill Head Co., Warren, Mich., changed its name to Michigan Special Machine Co., but no change has been made in either personnel or basic operating policies. Jerome Sullivan, president, says the firm plans to expand nationally and internationally.

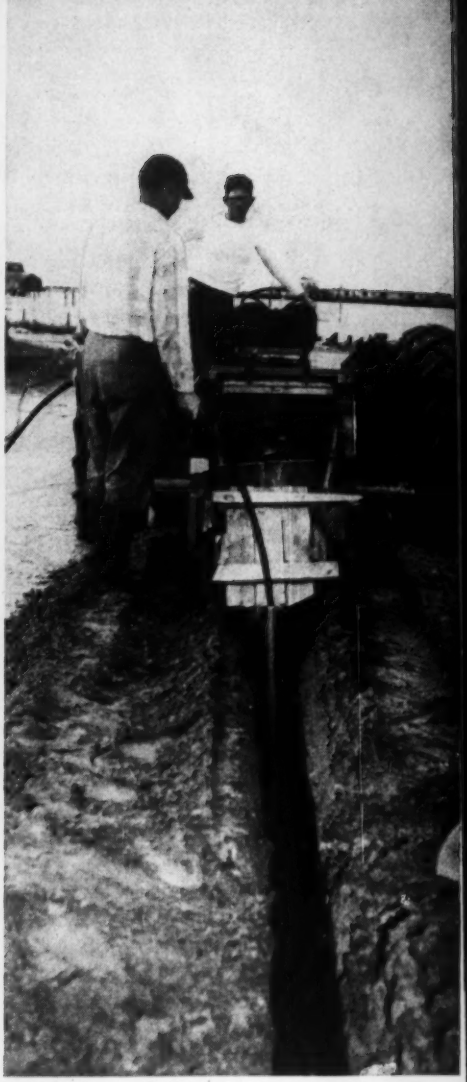
National Steel To Build

National Steel Corp., Pittsburgh, has purchased a tract of ground near Weirton, W. Va., as the site for two buildings. One will be the corporation's research center and the other will be a general office building for the Weirton Steel Co.

Quickly installed aerial cable. Here's an application where 600-volt Durasheath was quickly installed and easily terminated. Durasheath's neoprene jacket resists weather, abrasion, heat, fumes. Assured: dependable performance and long-range economy!



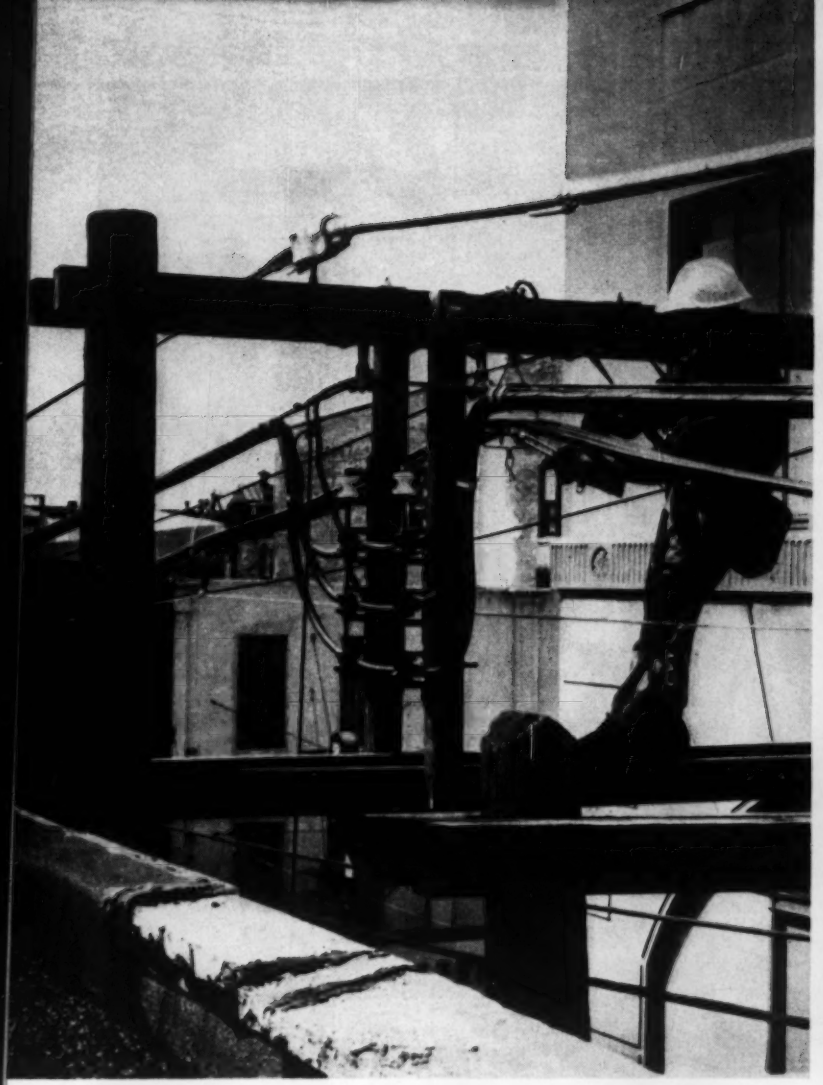
Factory-assembled aerial cable, made up of 3 single-conductor 15-kv Durasheath cables. Easy splicing, tapping and terminating meant simplified installation in the job shown here. No ducts, crossarms or insulators were needed. Wiring is neat, safe.



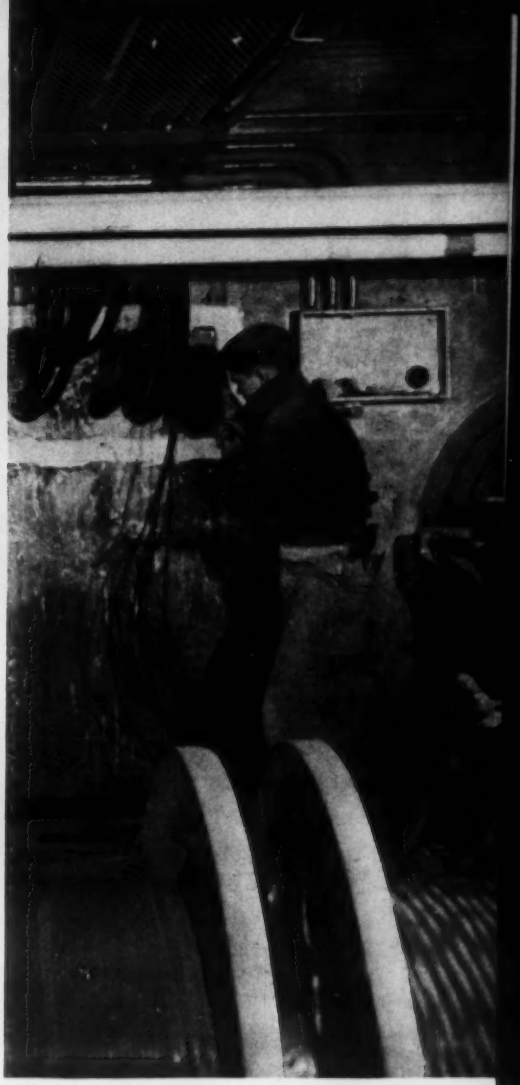
Direct-burial cable. The moisture-, oil-, and acid-resistance of Durasheath's jacket makes it the ideal cable for direct-in-the-ground applications like the one shown above. Its flexibility cuts installation time and cost because Durasheath is easy to handle. Its durability cuts maintenance costs!

Look at the ways you can save installation time and cost—with dependable Anaconda Durasheath Cable!

Wherever you want... whenever you want—this versatile power cable lets you install circuits fast... easily... at low cost! Use it aerially... in ducts... underground—in long runs with minimum splicing, indoors or out!



Field-assembled aerial cable. Versatile Anaconda Durasheath power cable was quickly field-assembled into aerial cable with the simple spinning operation shown here. Additional Durasheath was run along the building, grouped in a neat assembly by insulators and straps. It's another example of the way dependable Anaconda Durasheath adapts itself to your power cable needs—whether indoors, outdoors or both. Check into Anaconda Durasheath power cable for your wiring plans!



Installed in ducts. Durasheath's flexibility meant quick and easy installation here. And once installed, its tough neoprene jacket assures long, trouble-free life. Because Durasheath adapts itself to so many uses, your inventory problems are lessened—fewer cables need be carried in stock!

The installations shown above have one thing in common: they're all using Anaconda Durasheath* rubber-insulated neoprene-jacketed power cable —each for a different *kind* of application! Although the above photographs were taken at different installations, they could very well be pictures from one and the same job. Versatile Durasheath is a power cable that can be used to meet almost *any* installation need!

Such versatility in the use of Durasheath enables you to plan the most efficient layout for your wiring — then carry these plans through economically, with assurance of reliability. Talk to the Man from Anaconda about Durasheath. For full information, write: Anaconda Wire & Cable Company, 25 Broadway, New York 4, New York.

*Trademark

58376

ANACONDA DURASHEATH ALL-PURPOSE POWER CABLE
Available in all sizes, single and multiple conductor, copper or aluminum, 600 to 15,000 volts and higher.

Insulation. Type RHW, Anaconda ANW, AHW or butyl rubber compounds, each designed for specific purposes.

Jacket. Specially compounded neoprene with high resistance to flame, oil, acids, alkalies, sunlight and ozone. Has high tensile strength. Takes flexing at extremes of temperatures.

SEE THE MAN FROM

ANACONDA®

FOR **DURASHEATH CABLE**

the spirit of '76...

THE SPIRIT OF '76 . . . exemplifying strength —dependability—determination to move forward through the years.

Wyman-Gordon enters its 76th year still forging ahead with new forging techniques—still meeting the challenge of the seemingly impossible in this age of power and speed on the ground—in the air—and in outer space.

It is a far cry from the modest beginning in 1883 to the forging industry's most modern testing and research facilities in the extensive laboratories of Wyman-Gordon today—assurance of the ultimate in forging quality.

From the high wheel bicycle through the "horseless carriage" days to the "Mach era" of aircraft and space vehicles, Wyman-Gordon has marched under the standard of "The Greatest Name in Forging."

WYMAN-GORDON COMPANY

Established 1883

FORGINGS OF ALUMINUM • MAGNESIUM • STEEL • TITANIUM

WORCESTER 1, MASSACHUSETTS
HARVEY, ILLINOIS • DETROIT, MICHIGAN

NEW FAMILY OF ALLOYS— Uniworld Research Corp. of America, Cleveland, has licensed Thompson Ramo Wooldridge Inc. to produce castings with its SR (Super-Rustfree) steels. The new family of alloys is austenitic, nonmagnetic (even after severe cold working), and is age hardenable to high strengths. Principal alloying elements are chromium, nickel, molybdenum, and copper. The SR steels also have been made in plates, sheets, foils, bars, rounds, wire, and powder, says Karl Spitz, vice president of Uniworld.

CHECKS BILLETS FOR DEFECTS— Link-Belt Co., Chicago, says its new Magnaglo picks up invisible surface defects on 7½ tons of billets every minute. The device (made by Magnaflux Corp., Chicago) in some cases eliminates the need for scarfing, skinning, and pickling. When defects are located, only a localized area needs to be ground out.

NOT SO RARE EARTHS— You can expect increased benefits from rare earth metals in the near future, says the Department of Commerce. Scientists at the National Bureau of Standards are looking for practical applications for 15 (lanthanum through lutecium). Present applications include mischmetal, and the purification of steel and copper.

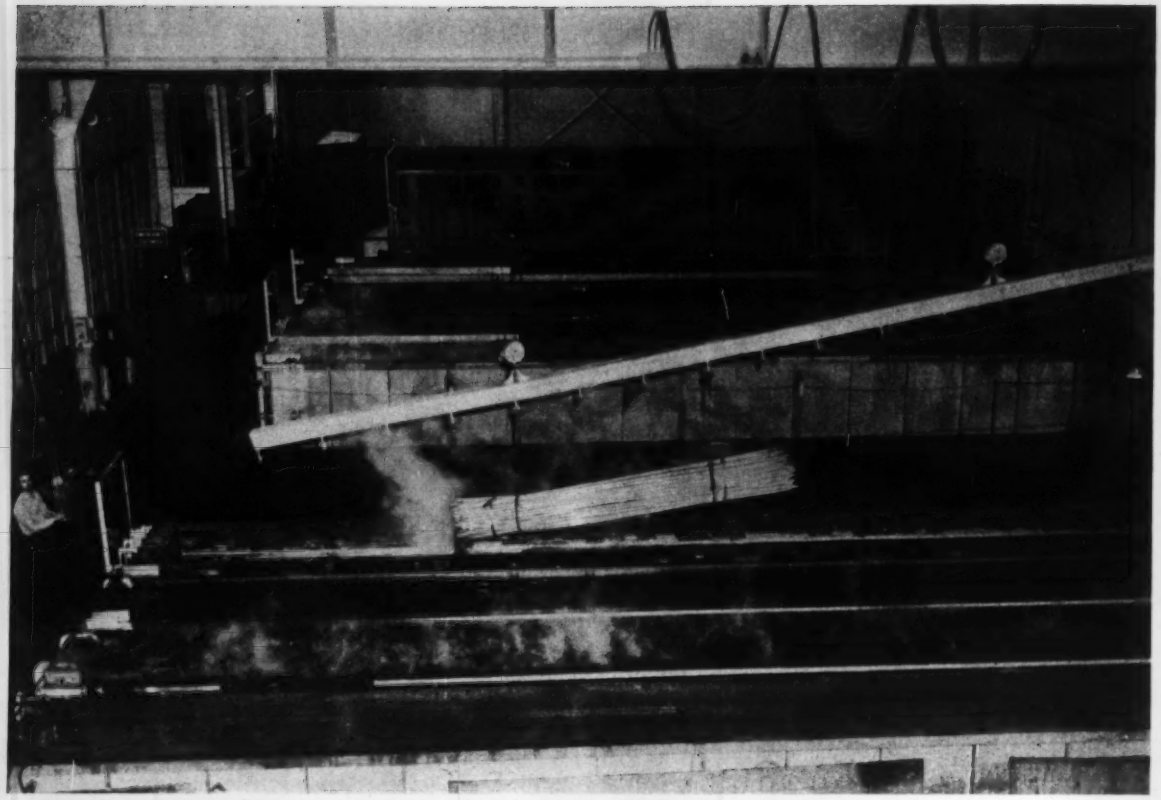
HI-TEMP SHEETS ON WAY— Contracts for sheets made of refractory metals that will resist 3000° F are about to be placed by the Manufacturing Methods Division, Air Materiel Command, Wright-Patterson Air Force Base, Ohio. Division heads claim such materials will replace most of today's sheet metals in hypersonic aircraft, orbital vehicles, and advanced weapon systems.

RESISTANCE CASTING— A new spotwelding technique employs hollow, shaped electrodes to form molten metal into studs and other raised shapes. By using abnormally high welding current and low electrode pressure, the process will work on a wide variety of metals. A peg of metal can be inserted into the electrode cavity and cast into such studs—the bond is exceptionally strong with similar metals, although strong mechanical bonds can be formed with nonmetallics. If no peg is used, two tabs must be added to the sheets being joined to provide enough metal to fill the cavity in one electrode (four, if there are cavities in both electrodes). The technique is an outgrowth of atomic energy work being done by the British Welding Research Association, Abington near Cambridge, England.

TOWARD A LASTING CHROME PLATE— The corrosion resistance of copper-nickel-chromium plating on steel or zinc diecastings can be substantially improved by increasing the thickness of final chromium plate from its present standard of 0.01 and 0.02 mil, say Dr. Edgar J. Seyb Jr. and William H. Rowan, Metal & Thermit Corp. research laboratory, Detroit. They predict the industry will probably adopt thicker coatings in several steps: First, 0.03 mil minimum on important surfaces; next 0.05 to 0.1 mil on other areas; and as equipment becomes available, the final goal of 0.1 mil minimum on significant areas.

PURER METALS— Tomorrow, you may be purifying metal surfaces by bombarding them with ions. Studies on sputtering (bombarded surface crystals fly out like a triangle of billiard balls) show that impurities and foreign crystals may be the first to leave the surface. Thus, closely controlled bombardment may explode off undesirables, leave pure metallic crystals.

PREDICTS SEALANT USE— Metalworking people are relying more and more on rubberlike sealing compounds, especially in metal curtain wall construction and assemblies employing combinations of materials, says Prof. Albert Dietz, Massachusetts Institute of Technology. (Automen have used sealants around joints between subassemblies for some time.) Another expert claims such materials can solve almost 100 per cent of metal joint problems if joints are designed properly.



Over-all view of the Wallingford Steel installation shows the cleanliness obtained by covering tanks with a compound (Serseal) that cuts down steaming and heat losses

Pipe Coating Adds to Draw Die Life

Oxalate protects the surface of stainless tubing and provides a good foundation for lubricants. Process cuts costs, reduces rejects, and leaves a better surface

A NEW kind of oxalate coating called Granodraw is increasing drawing speeds 300 per cent at the stainless tube reducing mill of Wallingford Steel Corp., Wallingford, Conn.

The material used in the process reacts with the metal surface, leaving a fairly hard, spongelike deposit which lubricants readily cling to. Other advantages:

1. Tubes are reduced twice (two draws) without a recoating. (Pickling and cleaning costs are cut.)

2. Draw die life is significantly increased.

3. Surface finish of products is better.

4. Cost: About $3 to $5 per ton of stainless steel tubing.

"I've also noticed that drawing loads are some 20 to 25 per cent less since using the new coating," says Donald Wiese, plant manager of the tube mill.

Mr. Wiese adds: "As the stainless passes through the die, the lubricant melts and recrystallizes absolutely evenly. It's a sure sign the lubricating action is uniform . . . it's the first time I've ever seen anything like that."

• **Purpose of Coating** — An inorganic layer on the stainless steel prevents metal-to-metal contact between the work and dies. It also acts as a porous surface which hangs on to lubricants better, cutting wear and improving surface finish.

The process at Wallingford Steel starts with rough tubing (up to 6 in. in diameter) which comes from the annealing furnaces or welding machines. Tubes are cleaned and descaled in a molten caustic salt bath (Kolene) which eliminates the need for an alkaline cleaner. After a water quench, pickling, or depassivation (to make the stainless surface respond to treatment), the tubes are immersed in a Granodraw solution. After rinsing, they are coated with a standard lubricant and sent

How the Coating Works on Stainless Steel

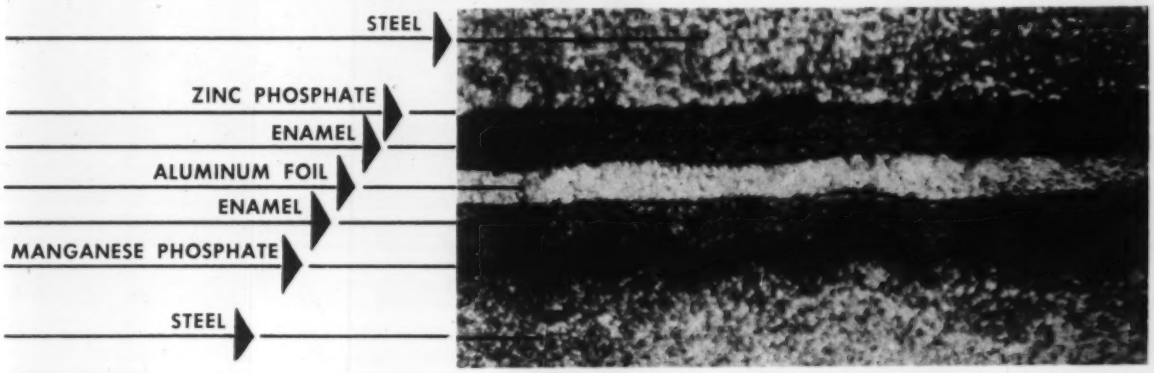
1. Activation of a stainless steel surface is the first step in the coating bath. Free sulfur dioxide teamed with hydrogen ions attack the surface, breaking down passivity (resistance to reaction) and taking some of the metal atoms into the solution as ions.

2. The activation disturbs the solubility products of other ions in the phosphating solution. Manganese oxalate, manganese sulfide, and some ferrous oxalate precipitate onto the stainless. Other materials like ferrous oxalate separate and become sludge.

3. Ions which have been used next to the stainless surface are immediately replaced from the main body of the bath.

(In general, Granodraw baths stay sludgefree. A coating called Serseal practically eliminates evaporation. Steps 1, 2, and 3 are practically instantaneous.)

Source: Amchem Products Inc.



Here is a cross section micrograph of a piece of steel with a phosphate coating. (It's similar to an oxalate coating.) In this case, the manganese type is heavier than the zinc. (Enamel and foil aid etching process)

to the draw benches for reduction.

• **Coating Properties**—The maker of Granodraw, Amchem Products Inc., Ambler, Pa., claims that the quality of such coatings can't be determined adequately in a laboratory—it takes a shop trial under varying operating conditions. Many previous formulations have been rather difficult to control — time, temperature, concentration, even light affected the coating. The company says Granodraw isn't so critical, is easy to maintain, and stable.

For example, you can come in on Monday morning after the bath has been standing for a weekend and go right to work.

Once the cycle has been established, it's quite easy to get good, reproducible coatings. (Cycles must be established for each material.)

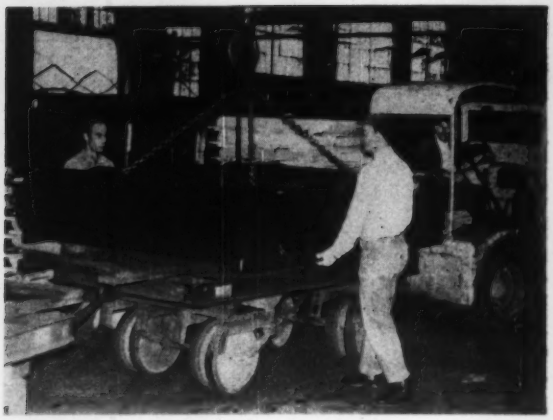
• **Other Uses**—Amchem points out that its coating works in wire drawing, deep drawing, and cold extrusion. Such a coating protects the surface of automobile bumpers during forming. Plating is much easier because there is little or no scratching.

In the Wallingford surface treating installation, all tanks rest on concrete piers. Painted asphalt linings, plastics (PVC), as well as stainless steel fittings keep corrosion effects on equipment to a minimum, says Amchem.

Pallet System Trims Handling Costs

It features pit-mounted hydraulic elevators that let one man load and unload heavy parts. Payoff time for the installation: Less than six months

OLD METHOD



Loaders guide a lift of five extruded electrodes onto a wagon for transfer to temporary storage in the yard

NEW METHOD

A lone operator rolls electrodes off the line onto a pallet load. The load rests on a hydraulic elevator

HERE'S how one company got a $178,000 return on a $74,000 investment in the first year.

The secret: A new system for handling carbon and graphite electrodes, tailored by engineers at National Carbon Co., Clarksburg, W. Va., a division of Union Carbide Corp. Pallets of parts, instead of individual workpieces, are handled.

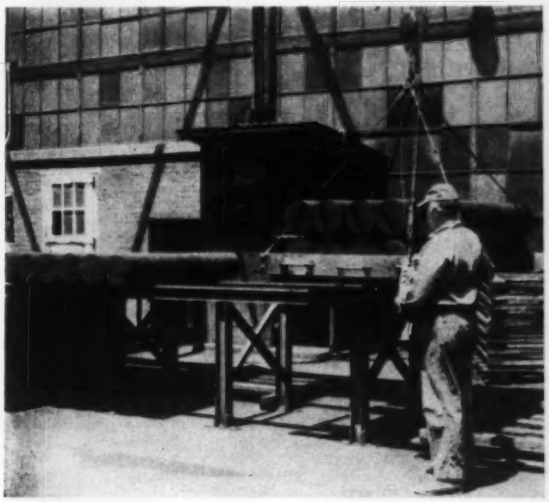
• **Problem**—Extrusion is only the start of electrode manufacture. The green electrodes must be handled a number of times to and from baking ovens, graphitizing furnaces (for the graphite electrodes), cleaning stations, machining, and final shipment.

Baking and graphitizing are batch operations. Temporary storage of large quantities of electrodes is required at several points in the production sequence. Extensive handling of the large, heavy parts is an important cost factor. A continuing methods improvement program was set up by the company to cut costs.

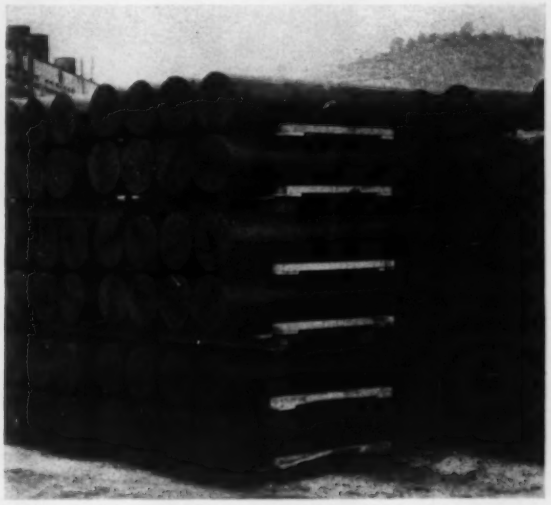
• **Old Way**—A series of multiple handling steps evolved over the years. After extruded electrodes were removed from cooling tanks, they used to be loaded by crane or fork lift truck onto a train of Wellington wagons and moved to a temporary storage pile. They were stacked with wood piling stringers separating tiers. A crew of as many as six men loaded the wagon train, and another crew of about the same size unload-

Snaking its way through the yard, a three-car train carries 18 electrodes that are ready for storage

Here, the "green" electrodes are stacked high on lumber strips, where they'll remain until they're needed



Electrodes are taken off the pallets and put on these rails. The rails feed them to the plant conveyor line



Stacking of pallet loads in the yard is done with lift trucks. Lifting of individual parts is no longer required

ed the train and piled the electrodes.

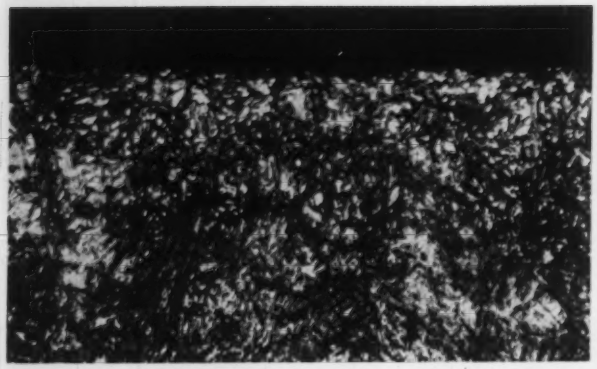
When oven capacity was available, electrodes were reloaded on a train (by six more men) and moved to a temporary pile. Then they were crane-lifted to be packed for baking. Once baked, electrodes were reloaded on a wagon train and taken to temporary storage. In subsequent stages, they were hauled to graphitizing, to cleaning, to machining, and to shipping.

• **New Way** — Six palletizing stations whipped the problem. They are platforms that can be hydraulically raised and lowered in recessed pits. One man at the station can make up unit pallet loads that are easily moved through the plant by fork lift truck.

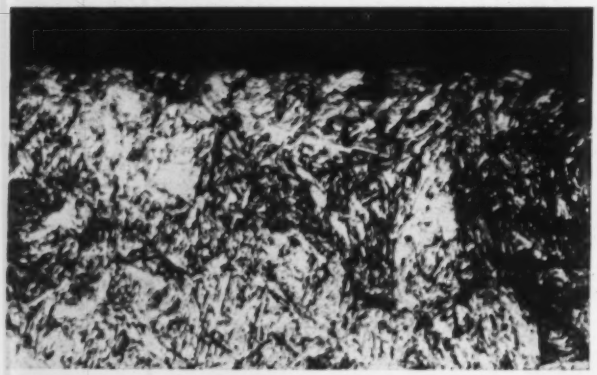
Two depalletizing stations remove electrodes from the pallets. They consist of monorail cranes above the belt rails that feed a conveyor belt.

• **Results** — The installation cost $74,000. It includes the palletizing-station elevators, depalletizing-station hoists, an initial supply of pallets, and pallet toting hand trucks.

N. K. Demmon, plant manager, tells STEEL: "Based on current wage rates and supply costs, the program is producing annual savings of $178,000." Savings include the freeing of 30 men (now moved to production work), elimination of piling lumber, elimination of maintenance and operation of the wagon trains, and reduction of electrode damage caused by excessive handling.



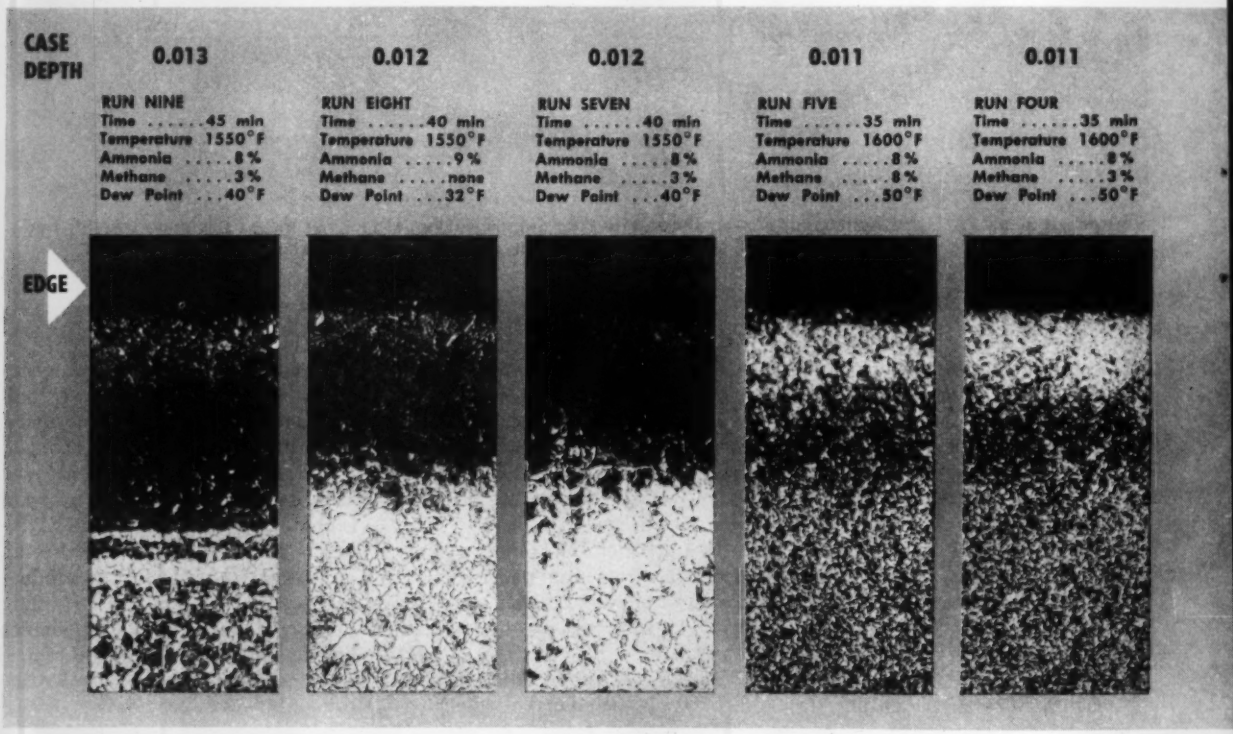
Photomicrograph (X500) of Run No. 8 shows excellent case characteristics. Carbonitriding time was 5 minutes less than the best trial run (No. 9)



Photomicrograph (X500) of Run No. 9 shows same excellent case characteristics, and it has a deeper case. Little, if any, austenite is retained

How To Carbonitride Low Carbon Steel

Westinghouse has worked out optimum conditions for processing 0.20 per cent carbon steel in a shaker hearth furnace. Advantages: Higher production, lower costs. Photomicrographs (X100) below are arranged left to right to show the trial runs which resulted in the highest hardness at a depth of 0.009 in.



LOW CARBON steel parts can be casehardened as well by gas carbonitriding as by liquid cyaniding, says Westinghouse Electric Corp.

The corporation's Materials Engineering Dept., East Pittsburgh, Pa., has worked out optimum temperature, dew point, gas volumes, and furnace times for casehardening production parts in an automatic, shaker hearth carbonitriding furnace.

The project was initiated by the Standard Control Div. of Westinghouse with preliminary experiments performed at the company's plant at Blairsville, Pa. The division was liquid cyaniding production parts in small pots and faced the need to hike production and cut costs.

In an investigation report, William Simon of the Materials Engineering Dept. recommends these operating levels for economy and best product:

- Operating temperature — 1550 to 1575° F.
- Endogas air-to-gas ratio—1.7:1 to 2.1:1.
- Endogas volume—700 cfh.
- Ammonia volume—8 per cent of total gas volume.
- Methane volume—3 per cent of total gas volume.
- Carbonitriding time—45 minutes minimum.
- Dew point—40° F maximum.

Mr. Simon cautions that successful gas carbonitriding in the furnace demands close control of those operating variables. They determine the surface hardness and depth of case.

In its study, Westinghouse defines case depth as that depth at which an oil quenched, carbonitrided part has a hardness of 87 Rockwell 15N (569 Knoop). The criterion for successful carbonitriding is a minimum case depth of 0.007 in.

- **Experimental Procedure**—Eleven trial runs were made in which temperature, gas volumes, dew points, and furnace times were varied.

The ratio of air to gas in the Endogas mixture was varied from 1.7:1 to 2.1:1 to get the various dew points. Volumes of Endogas used, 700 to 750 cfh; volumes of ammonia, 70 to 100 cfh; volumes of methane, 0 to 70 cfh.

All the trial runs gave hardnesses higher than 87 Rockwell 15N at the surface, but only five of them had the minimum hardness of 87 Rockwell 15N at a depth of 0.007 in. The surface hardness of parts from the five trials ranged from 91 to 94 Rockwell 15N.

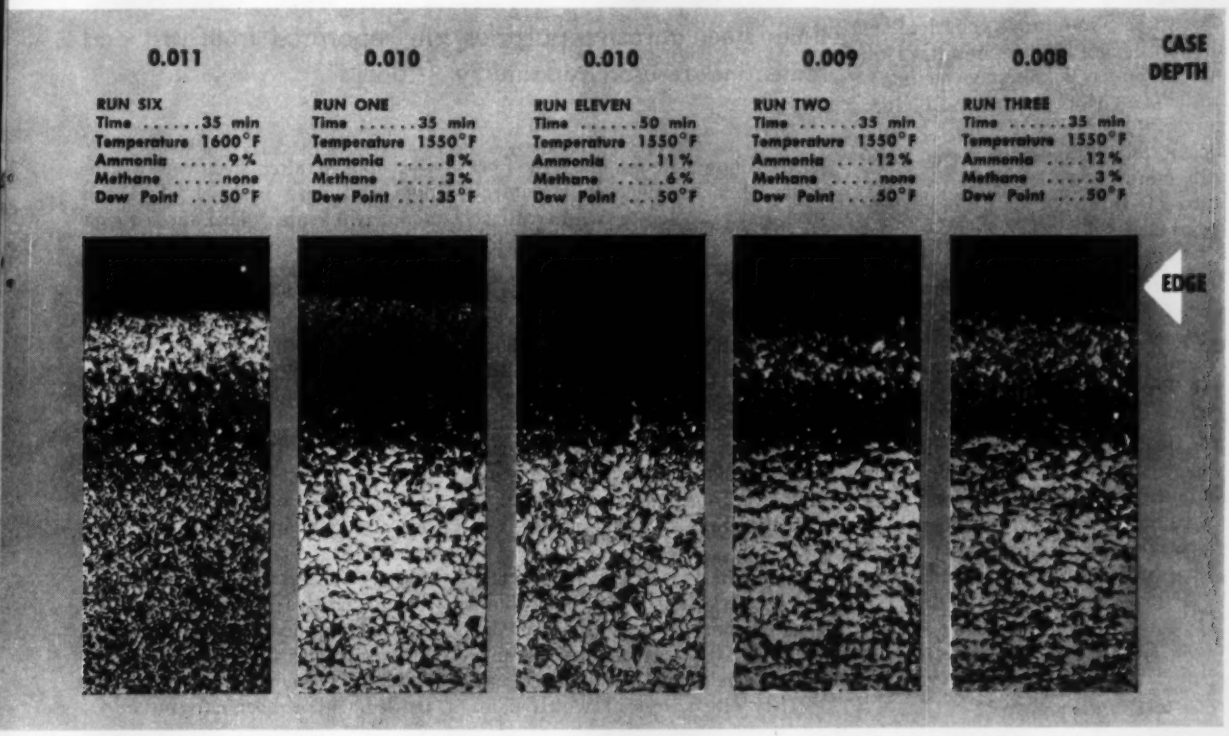
All trials gave cases at least 0.008 in. in depth (measured metallographically, to the first appearance of free ferrite).

- **Interpretation Necessary** — Although five of the trial conditions met the hardness requirement at stipulated depth, other factors have to be considered before optimum process conditions can be selected.

The primary function of a carbonitrided case is wear resistance. Failure usually occurs through surface fatigue which is a function of case depth and the amount of retained austenite.

Carbon and nitrogen, the two elements in carbonitriding which impart hardness to the case, have a high propensity for the retention of austenite. If not enough carbon and nitrogen are available, the case will lack hardness and depth. If too much is absorbed, the case will have prohibitive amounts of austenite.

- **Governing Variables**—The rate of carbon absorption by steel is governed by temperature, dew point, and the amount of carbon available. Higher temperatures result in faster diffusion and deeper cases; also longer times at temperature increase the case depth. A sufficiently low dew point is necessary to drive the



reaction in the proper direction (carbon into the steel).

The absorption of nitrogen by steel is also governed by time and temperature, but high temperatures inhibit the absorption of nitrogen. Longer times at temperature increase the depth of diffusion.

Westinghouse says the optimum temperature for carburizing is about 1700° F, for nitriding, 850 to 1000° F. Carbonitriding then requires a compromise.

The type of steel being carbonitrided and the quenching conditions also affect the depth and hardness of case. In the Westinghouse investigation, the hardness, case depth, and amount of retained austenite were influenced only by conditions in the furnace because the type of steel and quench were not varied.

• **Cost Is Factor**—The use of higher temperatures, richer Endogas mixtures, and longer furnace times result in deeper cases — but at increased cost. Another factor to be considered: Cost of the process, vs. advantages of a deeper case.

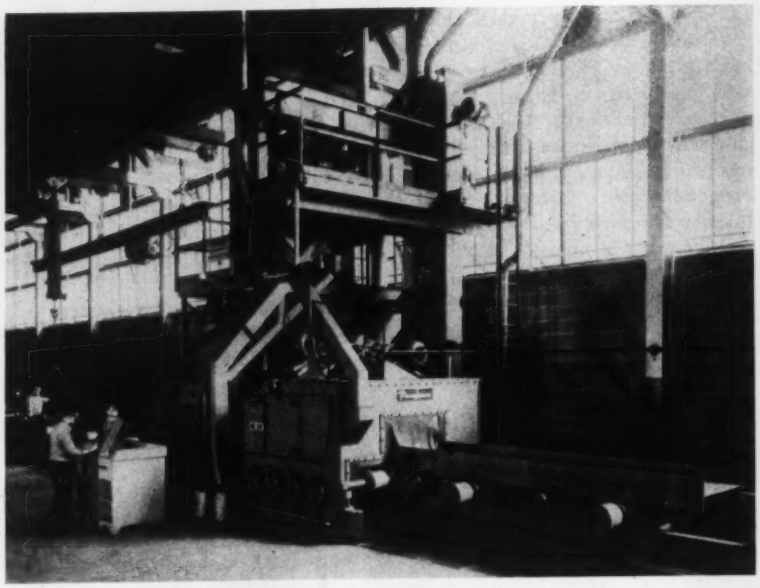
Parts from Run No. 9 (see photomicrographs) have the deepest case with parts from Run No. 8 a close second. Micrographs show that the parts contain little, if any, retained austenite.

If the time of Run No. 9 is decreased by 5 minutes, a considerable dropoff in case hardness results. The use of larger volumes of methane enrichment (8 per cent) and higher temperature (1600° F) are not sufficient to overcome the lesser time (35 minutes) and the leaner mixture of Run No. 5 (50° F dew point).

• **Final Choice**—Westinghouse says the choice of a standard process lies between the conditions of Runs No. 9 and No. 8. Run No. 9 produced the best product.

Mr. Simon suggests that further cost studies be made between Runs No. 8 and No. 9 to determine if it is cheaper to obtain the conditions of Run No. 8 (5 minutes less time, 1 per cent larger ammonia volume, 3 per cent less methane volume, but 8° F lower dew point).

• An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.



Rotoblast removes rust and mill scale, leaves good paint bonding surface on I-beams up to 36 in. high, or steel plates as wide as 84 in. and ½ to 2½ in. thick

Paint Lasts Longer on Blast Cleaned Structurals

Continuous process makes descaling a cleaner, faster operation; steel abrasive particles are separated from rust and scale and re-used repeatedly

HERE'S how you can make the first paint job last longer on structural steel that's exposed to weather: Blast clean all surfaces and apply the primer coat immediately.

Dominion Bridge Co. Ltd., Lachine, Que., has installed a Rotoblast machine, made by Pangborn Corp., Hagerstown, Md., to clean steel plates and structurals before painting and fabrication. The machine throws steel abrasive particles from all sides, removing mill scale and rust from the part. Result: A good bonding surface for paint.

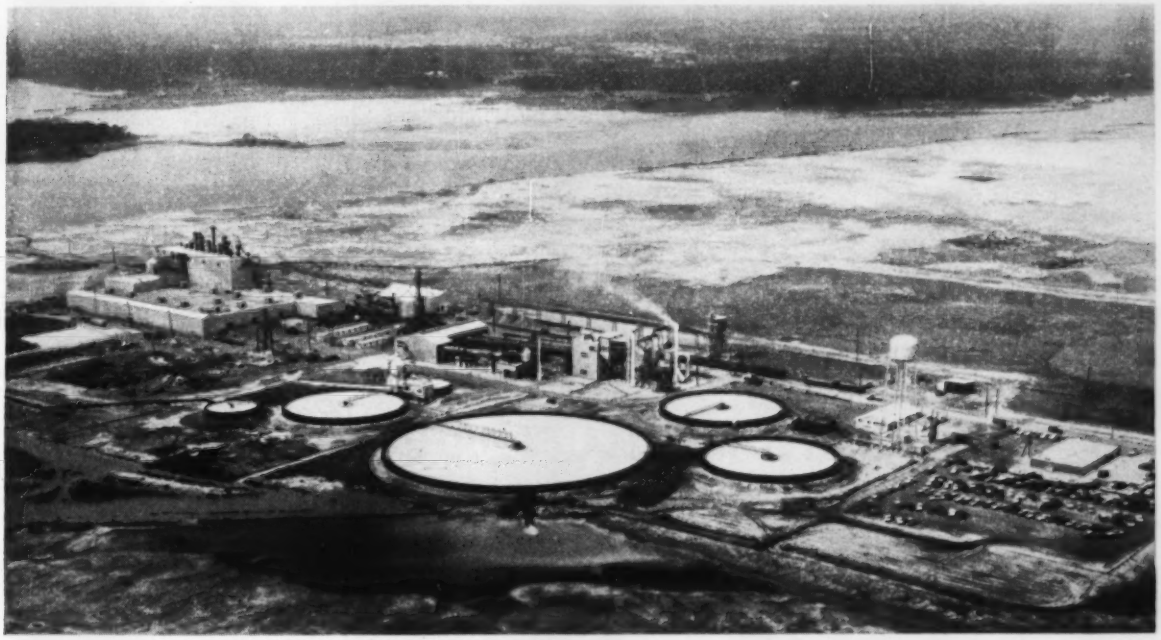
• **Excels in Test**—Paint lasts longer on surfaces that have been blast cleaned than on those prepared for painting by other methods, Pangborn officials claim.

They cite a test in which paint was applied after steel was weathered and wire brushed. It lasted about two years. Paint applied over mill scale (degreased) lasted a little more than eight years, and paint applied after pickling lasted just under ten years. Surfaces that had been blast descaled then painted were still in good condition after ten years when the test was discontinued.

• **Continuous Operation** — Pangborn says that Rotoblast cleaning costs less than other descaling methods and is adaptable to continuous production. A built-in system recovers steel abrasive particles.

All abrasive and scale particles are held inside the machine by ¼ in. steel plates mounted on a structural steel frame. Open ends are baffled with rubber curtains.

Now! Porter goes basic! The first in the south, this new basic refractories plant at Pascagoula goes "on stream" **during February**



Porter's new $12 million Pascagoula Works is a sea-water periclase and basic brick facility using the finest in modern equipment in a fully integrated production unit.

Southern industry will soon begin benefiting from faster deliveries and lower freight rates on all forms of basic refractories from H. K. Porter's new Pascagoula Works on the Gulf Coast. Inland waterways, too, will allow easy access to America's industrial heartland.

Products of this new works—Porter's 15th refractories plant—will include burned, chemically bonded, plated and plain brick, mortars, castables, plastics and ramming mixes of chrome and periclase compositions. A unique double-burning process employed in producing Porter periclase grain insures basic refractory products of the highest quality.

Annual output of this new plant indicates an ample, dependable source of supply. Equally important, Porter engineers and ceramists provide the complete customer service that is rapidly becoming recognized as a Porter principle.

For information on shipments, prices, or *any* refractories problem, write *Pascagoula Works, Refractories Division, H. K. Porter Company, Inc., Porter Building, Pittsburgh 19, Pa.*

PORTER BASIC REFRACTORY PRODUCTS

BASIC REFRACTORY BRICK

(burned and chemically bonded in both metal clad and plain categories)

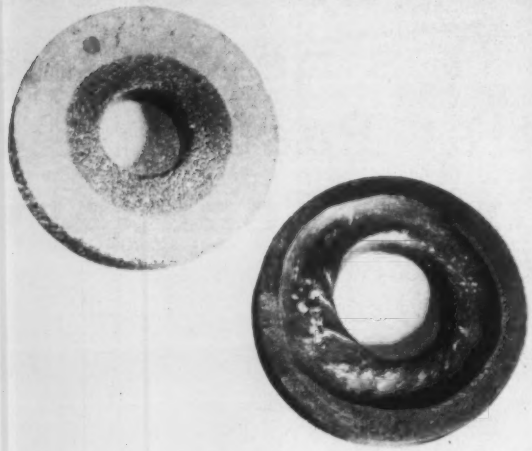
CM-30	**Chrome Magnesite**
CM-40	**Chrome Magnesite (Roof Brick)**
MC-70	**Magnesite Chrome**
Kilmag	**Magnesite Chrome (for rotary kilns, offered in burned and plated only)**
M-90	**Periclase**

BASIC REFRACTORY SPECIALTIES

Kromtite	**Chrome Air-Set Mortar**
Plastikrom	**Plastic Chrome Ore**
Kromor	**Ground Chrome Ore**
Kromform	**Chrome Castable**
Subhearth Kromform	**Chrome Castable**
Airkrom-C	**Coarse Chrome Gun Mix**
Airkrom-F	**Fine Chrome Gun Mix**
Magnaram 85	**Periclase Ramming Mix, 85% MgO**
Magnaram 95	**Periclase Ramming Mix, 95% MgO**
Peritite	**Periclase Air-Set Mortar**

REFRACTORIES DIVISION **PORTER** ***H.K. PORTER COMPANY, INC.***

DIVISIONS: Connors Steel, Delta-Star Electric, Disston, Forge & Fittings, Leschen Wire Rope, Riverside-Alloy Metal, Thermoid, Vulcan-Kidd Steel, H. K. Porter Company (Canada) Ltd.



Superrefractory Wear Applications

SINTER PLANTS—

Hopper linings, facing for feed tables, wind box elbow linings, dust collector linings, chute linings to and from coolers.

COKE PLANTS—

Guide facings, chute linings in screen house, hopper facing in coke cars.

BLAST FURNACES—

Chute and weigh hopper linings, downcomer elbow and tees, dust catchers, venturi gas scrubbers, skimmers, hot blast mains.

Apex discs in cyclone separators take terrific beating. Fine magnetite wore out the alloy (below) in only six weeks. A silicon carbide disc (Refrax) shows almost no wear after 13 weeks

Where Silicon Carbide Whips Wear

The hard, wear resistant properties of this ceramic refractory can reduce downtime and cut operating costs of critical points from sinter to the blast furnace

PROBLEM: Find a material that can stand the abrasion in sintering and steelmaking operations.
SOLUTION: Ceramic bonded silicon carbide; fused, cast zircon-alumina.

Those are the recommendations of the Carborundum Co., Niagara Falls, N. Y., which has comprehensive records at its Perth Amboy, N. J., plant for hundreds of installations. The locations vary from mines to blast furnaces.

Longer life means less downtime for repairs, cheaper over-all costs.

• **Examples** — Silicon carbide apex discs and liners for liquid cyclone separators last 20 times longer than their metal alloy counterparts. Certain wearing parts of pumps, conveyors, and classifiers also last longer when made of ceramics.

Target areas like chutes can be faced with fused - cast material that is accurately shaped to fit. One material, called Monofrax, has no ceramic bond that can fracture from impact. It is composed almost entirely of aluminum and zirconium oxides which approach the hardness of precious gems.

Any place where hot or cool sinter hits is a candidate for a silicon carbide lining. Air lock segments, chutes, and target areas are good examples. A tripper discharge chute leading to storage lasted six months with block paving—more than 500,000 tons of sinter against a small area wore off less than 2 in.

The majority of dust collectors are lined with silicon carbide, says Carborundum. Most of them appear to outlast their hard brick counterparts ten times.

• **Coke Plants** — Many materials have been tried to cut down wear from coke which is extremely abrasive. Among the most successful are silicon carbide brick and fused cast shapes.

Steep chutes (35 to 40 degrees) wear much longer when lined with silicon carbide bricks although they aren't suitable for flatter chutes which require a high polish. Smooth fused cast shapes work better whenever there is any impact or target area—in some installations, life appears to be indefinite.

Some movable coke guides (chutes) which feed coke from wharves into cars have been lined with silicon carbide. Experts say the paving of coke wharves might be feasible.

• **Blast Furnaces**—So far, no uses within a blast furnace have been proved. Much auxiliary equipment gets a greater boost in life from silicon carbide linings, including coke hoppers, hot blast main connections, dust catchers, and gas scrubbers.

Some consideration has been given to skip cars, but no results have been reported.

Other uses proposed include skimmer or splasher plates below the tap hole and the hot blast valve facing.

Shearing* LINES

Designed and Built by MESTA

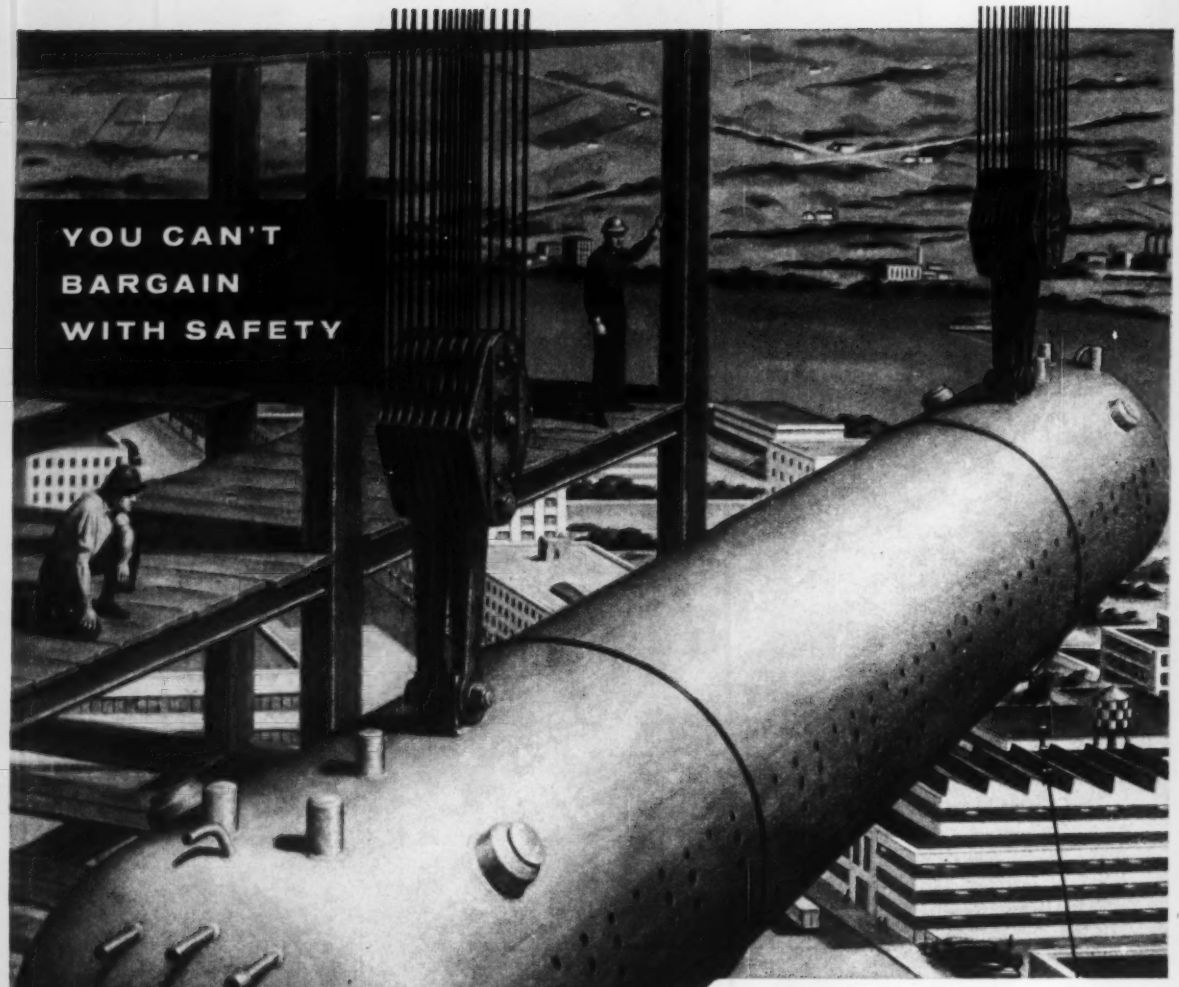
Mesta 60" Sheet Shearing Lines with Trimmers and Combination Rotary Flying Shears and Levellers Operating at McLouth Steel Corporation, Gibraltar, Michigan

Designers and Builders of Complete Steel Plants

MESTA MACHINE COMPANY

PITTSBURGH, PENNSYLVANIA

MESTA
THERE IS NONE BETTER



This 240,000-pound steam drum, built by Combustion Engineering for a large generating plant, is here being hoisted 120 feet into position by strong wire rope. It's a striking example of how . . .

safety rides on quality wire rope

You may never hoist loads as large as this 120-ton drum. But *safe, top quality wire rope is just as important to your own operations.* For, although the price of a "bargain" rope would be less, failure of such a rope could cost you thousands of dollars in wrecked equipment. Don't be a victim of false economy. Buy a wire rope that's a quality rope—buy Wickwire Rope.

5339

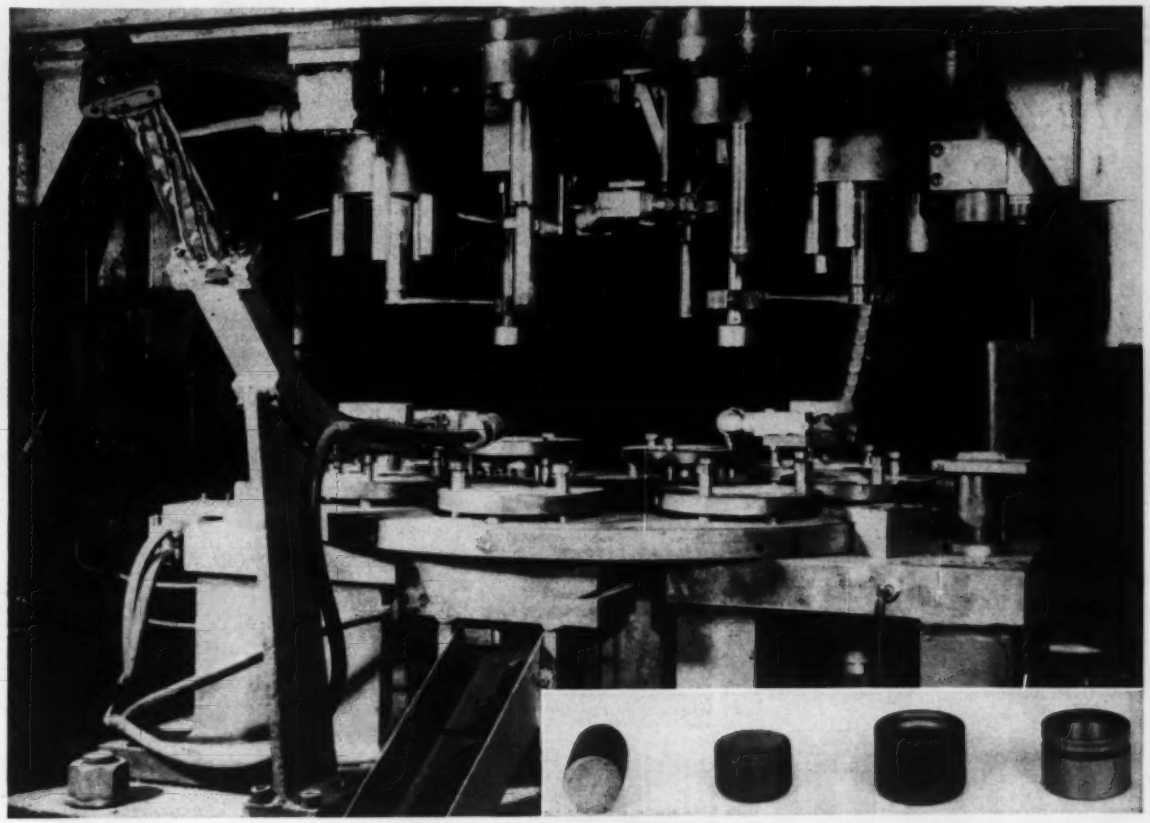
WICKWIRE ROPE — A CF&I PRODUCT

CF&I

LOOK FOR THE **YELLOW** *TRIANGLE*

PRODUCT OF WICKWIRE SPENCER STEEL DIVISION
THE COLORADO FUEL AND IRON CORPORATION

THE COLORADO FUEL AND IRON CORPORATION—Albuquerque • Amarillo • Billings • Boise • Butte • Casper • Denver • El Paso Farmington (N. M.) • Fort Worth • Houston • Kansas City • Lincoln (Neb.) • Odessa (Tex.) • Oklahoma City • Phoenix • Pueblo Salt Lake City • Tulsa • Wichita • **PACIFIC COAST DIVISION**—Los Angeles • Oakland • Portland • San Francisco • San Leandro Seattle • Spokane • **WICKWIRE SPENCER STEEL DIVISION**—Boston • Buffalo • Chattanooga • Chicago • Detroit • Emlenton (Pa.) New Orleans • New York • Philadelphia



Two bearing cups are extruded at once on this 500 ton, 8 station dial press. Inset shows production stages in sequence: rough, prepared, extruded, finished

Bearing Cups Cold Formed

Cold extrusion eliminates scrap in making universal joint components. Each press stroke forms two parts; conventional finishing follows

LOOKING for ways to save on production costs? Consider cold extrusion. It often produces parts that require a minimum of machining to meet close tolerances.

Universal joint bearing cups, used in propeller shaft assemblies, are being cold extruded at Saginaw Steering Gear Div., General Motors Corp., Saginaw, Mich.

They were made on 14, eight-spindle automatic screw machines. The company has realized substantial savings per piece since it started extruding the parts last July, officials report.

• **How They're Made**—The cups encase needle bearings around the universal joint trunnions. They're made of SAE 1012, HR coil steel, which is modified to high manganese, pickled, and limed. Finished tolerances: 1.158 to 1.160 in. OD, and 0.843 to 0.845 in. ID.

Coil stock is cold drawn to the right size, then fed into a ¾ in., two blow, cold header. The machine cuts off the slug, squares it, and chamfers both sides. Slugs are then carried automatically through a washer, grit blaster, annealer, and phosphate coater.

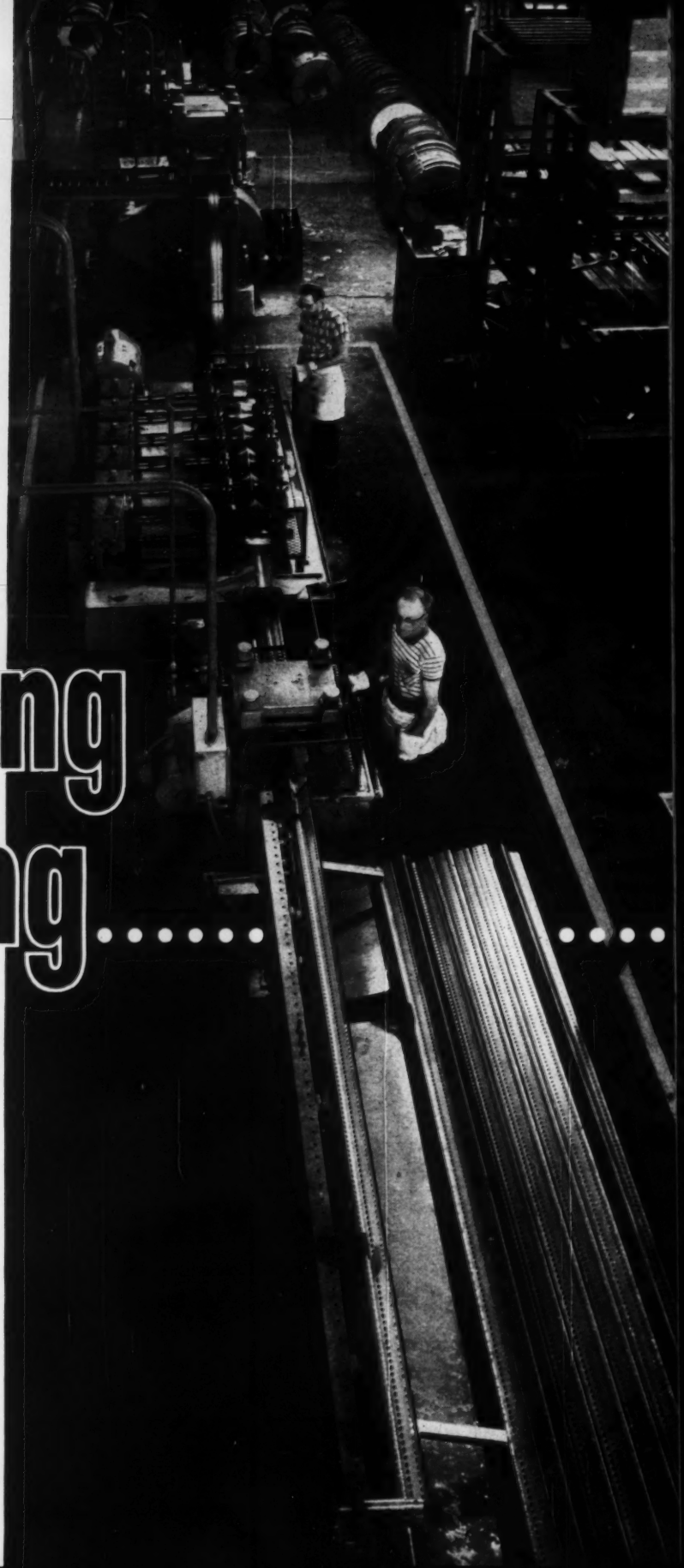
Prepared slugs enter a 500 ton, 8 station, dial table press from two sides; they're loaded, extruded, trademarked, and unloaded automatically. Each press stroke completes two bearing cups. Conventional finishing follows.

• **Production Problems**—The process sounds simple, but some time was needed to take out all the bugs. At first, there was some difficulty in getting the slugs to extrude symmetrically. Special care had to be taken to anneal the slugs properly, so they wouldn't crack during extrusion.

Punch breakage ran high, but the problem was solved by redesigning the punches and making them of a different material.

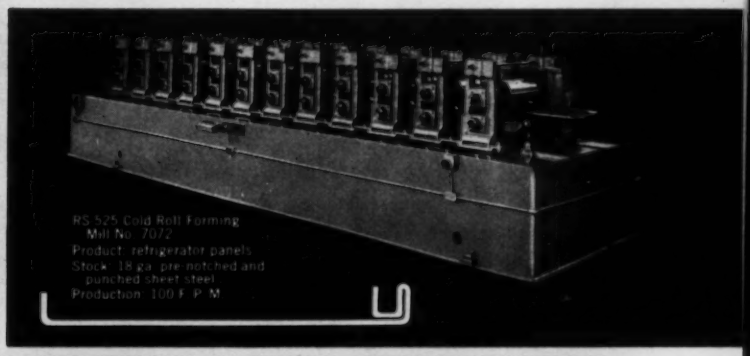
Although production rates have not been drastically increased, the division feels that savings in material make the change worthwhile. Gross hourly production is 3360 pieces, and the net is 3000. Five men operate the entire line.

Roll forming upswing.....

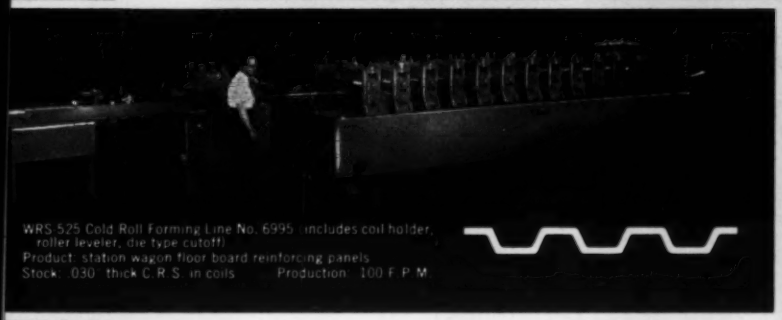


Recently installed in the plant of one of America's leading steel companies was this McKay cold roll forming line for the forming and cutting to length of industrial shelving angles up to .116" mild steel strip with pre-notched holes for joining. Line is composed of double rotating coil holder, roller leveler, pre-notching press, forming machine, cut-off, run-out and kick-off table.

Completely Automatic Rim Rolling Line No. 6798
Product: automobile and farm implement drop center wheel rims
Stock: welded steel bands
Production: 600-900 Rims per hour



RS-525 Cold Roll Forming Mill No. 7072
Product: refrigerator panels
Stock: 18 ga. pre-notched and punched sheet steel
Production: 100 F. P. M.



WRS-525 Cold Roll Forming Line No. 6995 (includes coil holder, roller leveler, die type cutoff)
Product: station wagon floor board reinforcing panels
Stock: .030" thick C. R. S. in coils Production: 100 F. P. M.

WRS-653 Cold Roll Forming Line No. 7229 (4) (includes coil holder, roller leveler, die type cutoff)
Product: bar joist channels
Stock: ⅛" to ¼" thick h. r. low carbon steel in coils
Production: 100 F. P. M.

WRS-420 Cold Roll Forming Line No. 7118 (includes coil holder, roller leveler, pre-notching press, die type cutoff)
Product: structural angles and channels
Stock: 16 ga. to 11 ga. h. r. and c. r. low C steel in coils
Production: 100 F. P. M.

Manufacturers of all kinds of products look to McKay Machine for roll forming equipment to lower man-hour costs!

To increase man-hour production, manufacturers are turning to the automated roll forming line. In recent years McKay Machine engineers have developed equipment that enables fabricators to produce more and more products in a continuous stream directly from coiled stock.

From drop center wheel rims and station wagon floor boards to finished refrigerator parts, manufacturers are finding roll forming gives them greater production control and product uniformity while eliminating many costly intermediate manufacturing functions.

Analyze your production—there may be a way you can take advantage of roll forming economies. To help you, why not rely on the 20 years of roll forming leadership of the *McKay Machine Company, Youngstown, Ohio.*

McKAY McK MACHINE

Applied to a stainless steel sandwich panel section with the adhesive, Tatnall Metalfilm strain gages are ready for use in minutes

Kit contains adhesive and instructions for use; it's available from Baldwin-Lima-Hamilton Corp.

Adhesive Speeds Bonding Of Strain Gages

It cures in minutes, producing a strong bond on virtually any surface; no heat or excessive pressure is needed. It's easy to use, needs no mixing or stirring

IF YOU work with stress analysis, you'll be interested in an adhesive called Eastman 910. It cuts the time needed to bond strain gages from hours to minutes (see STEEL, Nov. 11, 1957, p. 128).

Strain measurements can be taken 5 minutes after a gage is applied, vs. 12 to 24 hours with other adhesives.

The adhesive is easy to handle, since no mixing is necessary before application; and it can be used on just about any material.

No heat, excessive pressure, or solvent evaporation is involved. There's little shrinkage as the adhesive cures; residual stress in the film is minimal.

• **How Gages Work**—Strain gages have made significant contributions to the advancement of stress analysis. Basically, they are electrical circuits that change in resistance value under mechanical strain.

The devices are applied to virtually any flat or curved surface and connected to appropriate testing equipment. They measure the strain or change in dimension caused by a force or load applied to the structural member or material under test.

Strain gages are especially popular in the aircraft industry; 3000 to 6000 gages are used on a typical experimental plane during flight tests. About 8000 were used in testing the Douglas DC-8 for commercial use.

• **Where To Get It**—The adhesive, a product of Eastman Chemical Products Inc., New York, is available through two major strain gage producers: Electronics & Instrumentation Div., Waltham, Mass. (a division of Baldwin-Lima-Hamilton Corp.), and Tatnall Measuring Systems Co., Phoenixville, Pa., a division of Budd Co. Both have tested the adhesive for a year.

Machine Setup Cuts Costs

Multiple spindle machines help reduce production costs at International Business Machines Corp., Endicott, N. Y. In one operation alone, annual savings in production costs come to $18,000.

A two rail track connects 18 of the machines, made by National Automatic Tool Co. Inc., Richmond, Ind. Cars holding various fixtures can be positioned under the heads of any machine.

Various combinations of the machines drill, ream, and tap 50 to 60 different parts. Four operators produce about 50 parts per 8 hour shift, vs. eight or nine on previous machines.

If you use locating dowels, hinge pins, rivets, set screws . . . or straight, knurled, tapered or cotter-type pins—you should look into the savings in time and money offered by the Rollpin formula. **(1)** You start with a straight production-drilled hole—no threading, peening or precision drilling is needed. (For example: permissible and typical hole tolerances for effective Rollpin installation are .125-.129 for the ⅛″ diameter pin; .250-.256 for the ¼″ pin.) **(2)** You need no more than a hammer . . . simply modified hand tooling, arbor press or hydraulic press to set the Rollpin into a secure, vibration-proof fit. **(3)** You just drive the Rollpin into the hole . . . and that's it. Spring action locks the Rollpin in place . . . regardless of impact loading, stress reversals or severe vibration. Yet it is easily drifted out . . . and can be reused in the same hole. For information on how Rollpin can simplify your fastening jobs, fill in and mail coupon below.

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Elastic Stop Nut Corporation of America
Dept. R56-260, 2330 Vauxhall Road, Union, New Jersey

Please send the following free product information:

- ☐ Rollpin dimensional data
- ☐ Rollpin installation suggestions
- ☐ Here is drawing of our product. What self-locking fastener would you suggest?

Name_____ Title_____

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Why You Should Plate with a Sulfamate Bath

- Stressfree deposit won't peel
- Strength and hardness are controlled
- Level deposit requires little buffing
- Degree of brightness is controlled
- Bath composition is easy to control
- There's little reaction with impurities
- Metallic deposit is extremely pure
- Grain structure, ductility are good
- Base has good fatigue strength
- Safe for personnel, equipment

After weighing, type bars are poured into a hopper that's tilted to load the barrel. Every 4 minutes the machine produces 15 lb of plated parts

Barrel Unit and Sulfamate Bath Make Nickel Plate Stressfree

Improper bonding and peeling are no longer problems with parts that are formed after plating; higher cost of conveyor or still tank processes is avoided

YOU CAN form parts after plating them in a nickel sulfamate bath with no worries about imperfect bonding and peeling. Use of barrel equipment will assure a high quality nickel plate and hold the line on production costs.

The system is being used at the Hartford, Conn., plant of Underwood Corp. Barrett Chemical Products Co., Shelton, Conn., supplies the solution. It's filtered and electrolytically purified, ready for immediate use.

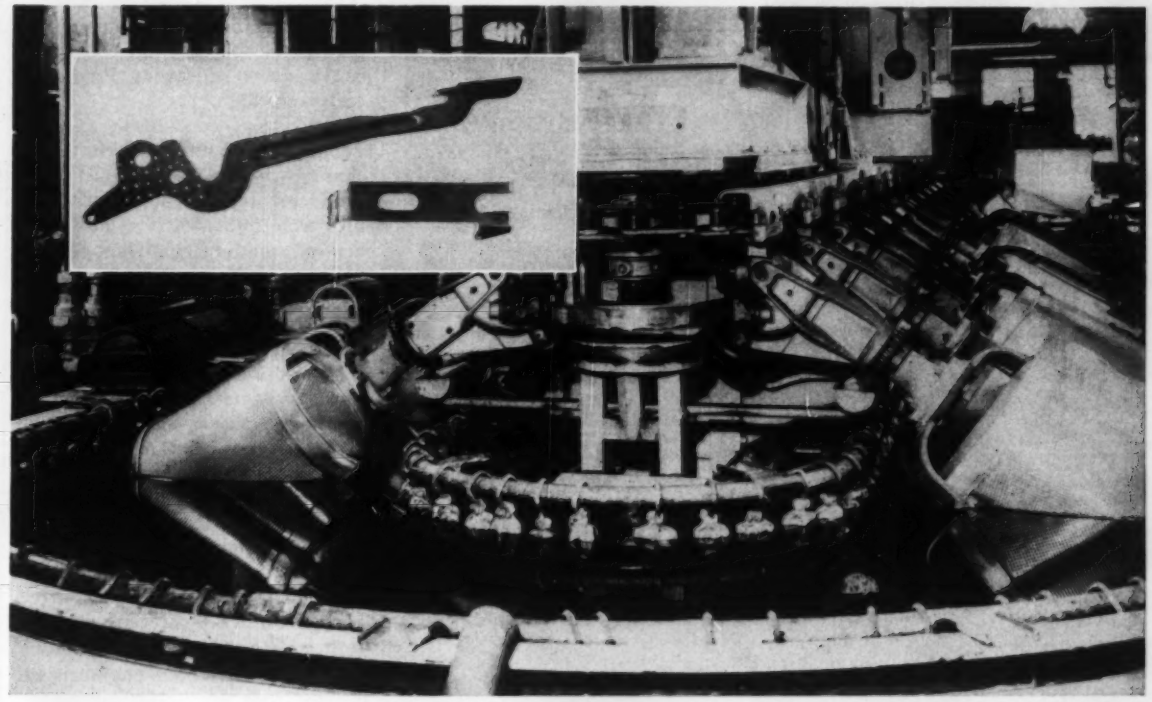
• **Good Coverage**—The process deposits a uniform plate, even in deeply recessed parts. Example: End of a typewriter type bar, where the type face is later attached. The throwing power of nickel sulfamate is high, and good coverage is possible even in cavities.

Low internal stress is maintained, in spite of metallic and organic impurities that enter the bath during the plating process. Forming and crimping can be done after plating without scrap losses from peeling.

Plate hardness and ductility are uniform, and the semilustrous finish is attractive.

Success with type bars prompted the company to use the process for finishing other complex internal parts for business machines.

• **Process Is Automatic**—Parts are weighed and placed in a hopper that's tilted to load the barrel. After that, the automatic barrel plating equipment takes over.



Parts are finished automatically in the barrel plating unit. They go through cleaner, rinse, mild acid, second rinse, then into the nickel sulfamate bath for 45 minutes. Inset: Typical parts plated in the sulfamate process

Before plating, parts pass through a cleaning solution, a rinse, a mild acid, and a second rinse. Then they go into the nickel sulfamate for 45 minutes. A plate 0.00015 to 0.0002 in. thick is deposited.

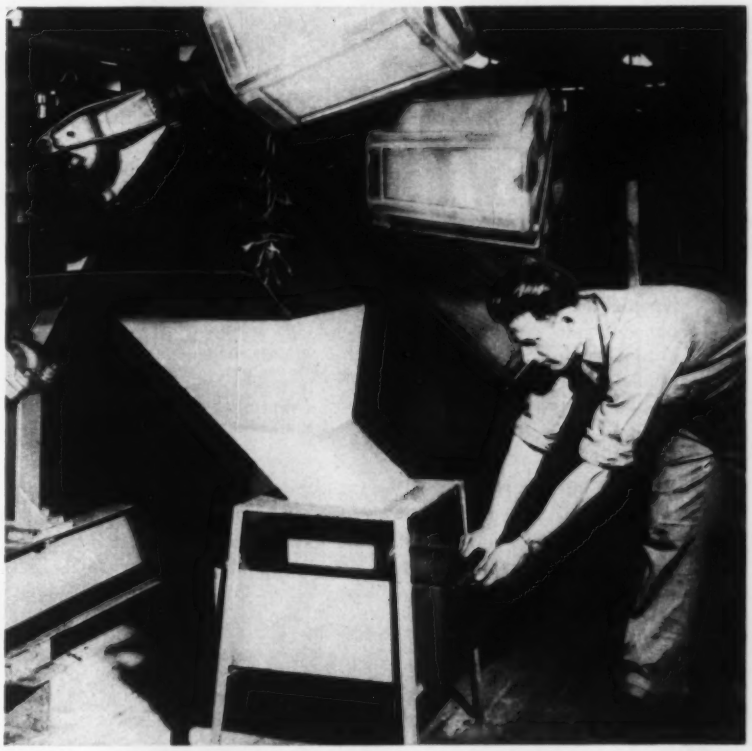
After plating, parts are rinsed, hot air dried, and deposited in tote pans, ready for assembly or additional forming.

Before the solution was used for barrel plating, a few parts from each barrel load had to be tested for plate adhesion by extreme bending. Now only an occasional part is tested.

• **Problems in Finishing** — Nickel plating of type bars (or other small business machine parts) has always been a difficult operation. Their shape causes them to roll or tumble in a ball during barrel plating. Results: Uneven distribution of plate and poor soldering properties.

Another problem: After plating, each type bar is bent to a predetermined angle. If the electroplate bond isn't perfect, strain causes the plate to peel.

To assure good bonding and even



After plating, business machine parts are rinsed, hot air dried, and deposited in tote pans; They're ready for assembly or additional forming

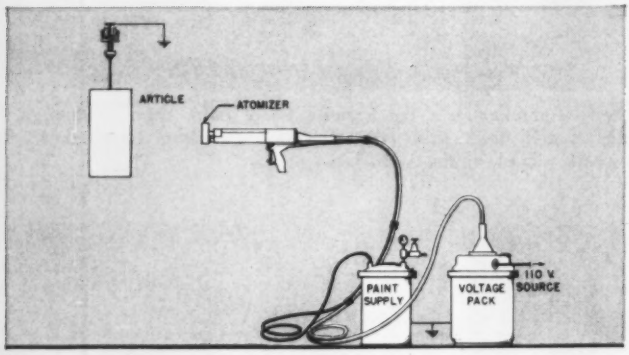
Here it is—

The PAINTING TOOL ALL Industry has been waiting for!

The NEW

RANSBURG

NO. 2 PROCESS ELECTROSTATIC HAND GUN



CUTS PAINTING COSTS!

Saves Paint because there's no waste. Now, for the first time, the high efficiency of Ransburg's No. 2 Process automatic equipment is available to you in the NEW Electrostatic Hand Gun.

Saves Labor, Increases Production because it is faster on many types of articles such as those fabricated from perforated and expanded metals, tubing, rod and wire. This is due to the "wrap-around" nature of electro-spray which paints ALL sides of such articles from one side only.

Saves in Equipment because no conventional spray booth is required—no water-wash, no sludge recovery! Uses no compressed air for atomization.

Saves Building Heat Loss because only mild ventilation for removal of solvent vapors is necessary, and . . .

Maintenance Costs Are Cut because clean-up and maintenance labor is only a fraction of that required by other, less efficient painting methods.

See how YOU can save in your own finishing department, and at the same time, improve the quality of the work. Write for literature and information showing how the Electrostatic Hand Gun has been proven on different products in a variety of industrial plants.

Call or write

RANSBURG

Electro-Coating Corp.

Box-23122, Indianapolis 23, Indiana

plate distribution, the company rack plated the parts, using automatic conveyors or still tanks. Production costs were high.

• **Sulfamate Solution Perfected**—A change was made in the method of producing type bars. Potential savings were indicated if a satisfactory deposit could be applied by barrel plating.

Several solutions were tried, with inconsistent results. Richard C. Barrett, president of Barrett Chemical, suggested a modification of the basic nickel sulfamate solution. From the beginning, results were good.

Further modification of the bath produced a highly satisfactory deposit.

• **Modify Plating Equipment**—Underwood purchased an automatic barrel plating unit, with 23 barrels, from Frederick B. Stevens Inc., Detroit.

Underwood process engineers calculated that the unit must plate a barrel load of 1500 type bars (15 lb) every 4 minutes to meet production demands. Modification of barrel design and contact assembly made larger barrel loads permissible, and helped the company meet production quotas.

• **Other Applications Seen**—Worn or mismachined parts are often salvaged by application of a heavy nickel plate. The deposit must be free of tensile stress, so the fatigue properties of underlying steel won't be impaired. By controlling stress in plating, it's possible to obtain a plate that prevents fatigue fractures and keeps cracks from growing in the base metal.

Such control protects leading edges of propeller blades and jet engine compressor blades from small stone abrasions.

Hard but ductile nickel sulfamate deposits are being placed on contact pins and jack terminals of electronic equipment. They're also used as undercoats for gold and rhodium in printed circuitry. Alloy deposits of nickel, cobalt, and iron are used in magnetic applications, such as memory drum components in electronic computers.

• *An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.*

Vertical Floturn Can Be Loaded Automatically

CHIPLESS metal forming of virtually any metal or alloy can be done on the No. 12 Vertical Floturn. It produces conical, cylindrical, and contoured shapes (singly or in combination) from preformed or machined blanks.

Built for high production of parts up to 16 in. in diameter and 15 in. long, the machine has an automatic operating cycle to which automatic loading and unloading may be added.

A feature is automatic compensation for variations in blank thickness. Differences of as little as 0.003 in. may result in rejection of workpieces when they are not compensated.

The machine has radially opposed rollers which virtually eliminate deflection and assure extreme accuracy. Automatic hydraulic tracer control is provided to make production of complex part shapes a pushbutton operation.

At the beginning of the automatic cycle, a blank centering device and finished part stripper is in position to receive the blank. The ram spindle clamps the blank to the mandrel and the carriage moves into flowing position. The spindle starts and the rollers form the part under hydraulic tracer control.

At the end of the operation, the stripper removes the finished part from the mandrel. For more information, *write* Lodge & Shipley Co., 3070 Colerain Ave., Cincinnati 25, Ohio.

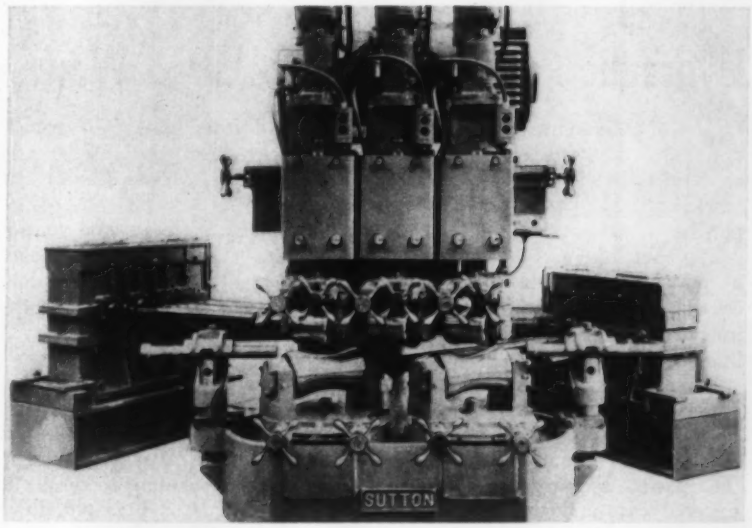
Tube Straighteners Handle Difficult Materials

THIN-WALLED tubes and bars of stainless steel, brass, zirconium, titanium, and other materials can be straightened in high production with this series of five-roll, rotary straighteners.

In the five-roll design, three small pressure rolls are opposed by two large straightening rolls. All rolls are driven by a single motor through a Synchro-Drive which automatically co-ordinates the surface speed of each bank of rolls.

Synchronized speeds compensate for roll wear and differences in angular roll setting. Less redressing is required for maximum roll life.

Other features: Quick setup and changeover, power operated screw-



downs, simplified roll angle adjustment with positive lock, open-frame construction for fast roll change, and pneumatically counterbalanced vertical rolls.

For more information, *write* Sutton Engineering Co., First National Bank Bldg., Pittsburgh 22, Pa.

Furnaces Heat to 5000° F

HIGH temperature research and similar work requiring temperatures to 5000° F can be done in the Hevi-Duty carbon-resistor tube furnaces. Close control and regulation of temperature are assured by the use of a saturable reactor control system.

Gates on both ends of the heated zone minimize radiation losses. Terminal contact losses are eliminated by a machined fit of the graphite terminals to the heating tube.

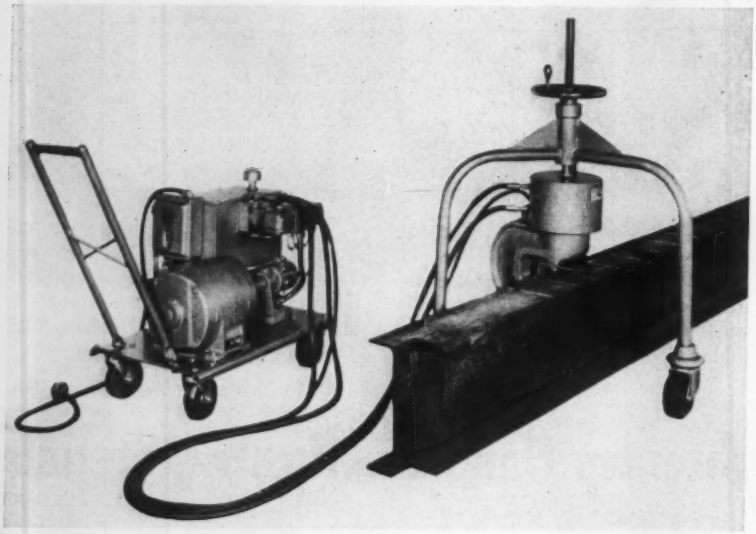
The furnaces come with internal heated lengths of 1 x 12 in. to 5 x 48 in. For more information, *write* Hevi-Duty Electric Co., Milwaukee 1, Wis.

Lift Truck Is Versatile

WITH the Counterweighter, you can handle double faced pallets as well as wire coils, tote pans, rolls, dies, jigs, and carboys.

A unique balancing system on this battery powered hydraulic lift truck makes it adaptable to any weight lifting problem from 1 to 1000 lb. It solves many elevator and other light load floor requirement problems because it operates in often inaccessible areas. Only 22 in. wide, it is ideal for stacking and traveling in 24 in. aisles.

For more information, *write* Big Joe Mfg. Co., Wisconsin Dells, Wis.



Hydraulic Punch Wheels to Large Work

YOU CAN eliminate awkward handling and costly drilling of large or hard-to-handle work with the new Hydramic portable hydraulic punch.

The complete machine consists of a punch unit with pushbutton control, a hydraulic power unit, and interconnecting flexible hydraulic lines.

Punch units of 5 to 30 ton capacity are light enough to be carried from job to job. Heavier units of 50, 70, and 90 ton capacities have the power unit mounted on a castered cart and the punch unit suspended from a castered tripod. The punch head also can be suspended from a crane, hoist, or A-frame.

One man can locate and control the unit. The cycle time ranges from 2 to 19 seconds, depending on size, and the units can be indexed from one hole to another in seconds.

Dies and punches can be changed in less than 2 minutes; there is no chance of misalignment between punch and die after replacement. For more information, *write* W. A. Whitney Mfg. Co., Rockford, Ill.

Ultrasonic Machining Tool Operates Multiple Stations

PRODUCTIVITY of Sheffield-Cavitron ultrasonic machine tools can be increased up to 40 times with the addition of new tooling that pipes ultrasonic energy around corners.

The extension type tooling transmits the high frequency, mechanical oscillations from the transducer by curved cylindrical rods to remote machining stations located at any angle to the transducer. There's one rod or ultrasonic transmission line for each station.

In one application, eight machining stations are mounted on the table of a standard machine, permitting up to eight different precision operations to be conducted simultaneously, or eight operations to be done on the same part as it progresses through the stations.

Each unit accommodates a cutting tool up to 1½ in. in diameter and will machine workpieces up to 2 in. in diameter to a depth of 0.050 in.

For more information, *write* Sheffield Corp., subsidiary of Bendix Aviation Corp., Dayton 1, Ohio.

Vibration Recorder Helps Maintenance Scheduling

WITH a permanent record of machinery vibration at time of installation, periodic vibration readings give you ample warning of equipment wear and allow you to schedule maintenance before a breakdown occurs.

Permanent records of vibration frequency, amplitude, and wave form can be made easily with the Korfund Hand Vibrograph. It weighs less than 5 lb, makes recordings by

When you buy Motor Starters--

YOU PAY FOR OVERLOAD PROTECTION

Only ONE-PIECE Overload Relays give 100% Protection • Only with ONE-PIECE construction can you *know* you've installed the heater correctly. Only with ONE-PIECE construction can you *know* the heater is exactly centered, or properly positioned, so that it performs according to its rating. Only with ONE-PIECE construction can you *know* your motors have full protection.

Only Square D has ONE-PIECE Construction • ONE-PIECE construction *eliminates* any possibility of heater misalignment. Square D melting alloy thermal overload relays can be installed only one way. They are tamper-proof. They are factory-assembled, are *individually* calibrated and tested. Repeated tripping will not affect accuracy.

Insist on Square D melting alloy thermal overload relays

Write for Bulletin SM-275 for the complete story on Square D starters with ONE-PIECE thermal overload relays. Address Square D Company, 4041 N. Richards St., Milwaukee 12, Wisconsin.

...BE SURE YOU GET IT!

Heat-responsive element (solder pot) provides accurate response to overload, yet prevents nuisance tripping.

Heat-producing element is an integral part of overload unit. It's permanently joined to solder pot, can't become misaligned.

Individual factory inspection of every Square D melting alloy thermal overload relay means performance you can trust. Each unit is calibrated and thoroughly tested to make sure it will perform according to its rating.

EC&M HEAVY INDUSTRY ELECTRICAL EQUIPMENT...NOW A PART OF THE SQUARE D LINE

SQUARE D COMPANY

ink or waxed paper, and has a tape take-up reel for storing of readings.

The instrument will indicate the amount of wear in bearings or cutting tools, rotorshafts, and similar equipment. It aids in balancing equipment, permits measurement of disturbance within a structure, and can be used as a read-out for differential analyzers having straight-line motion output.

For more information, *write* Korfund Co. Inc., 48-40E 32nd Place, Long Island City 1, N. Y.

Square Vacuum Cup Lifter

STEEL and nonferrous plates can be handled quickly and easily with square cup vacuum lifters.

The units have 20 in. square cups, each with 400 sq in. of lifting surface. At 10 psi, each cup has 4000 lb of lifting power. The square cups are adapted to one, two, four, and eight cup lifting units.

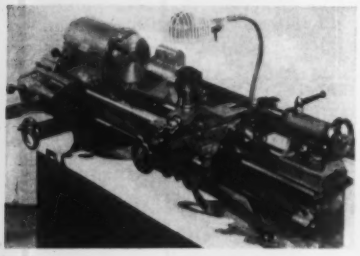
The vacuum pump maintains a constant reserve of vacuum in the tank, which will hold the load for some time even in the event of an electrical failure.

For more information, *write* Dept. 4-D, Vac-U-Mation Div., F. J. Littell Machine Co., 4127 R N. Ravenswood Ave., Chicago 13, Ill.

Bench Lathe Features Variable Speed Drive

THIS machine fills a need for a low-cost lathe to do heavy duty work in metalworking shops, maintenance shops, and toolrooms. It features a variable speed drive and ¾ in. collet capacity.

The lathe drive gives the operator the advantages of infinitely variable speed from 50 to 1500 rpm plus the high torque transmitting power of matched V-belts in the final drive to the spindle.

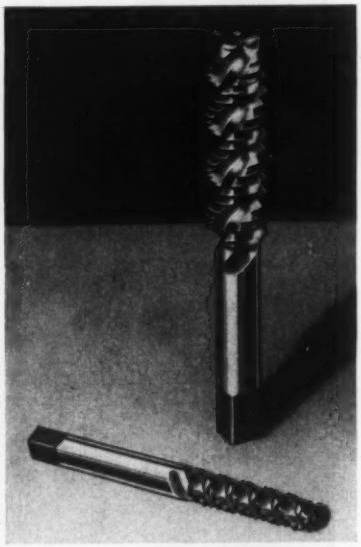


The smooth, quiet direct drive position can be used extensively for many thread pitches and heavy cutting usually done in gear drive. A quick-change gearbox provides a choice of 54 feeds or thread pitches.

Price of the lathe without bench, motor, and switch, is less than $700. For more information, *write* Delta Power Tool Div., Rockwell Mfg. Co., 451 N. Lexington Ave., Pittsburgh 8, Pa.

Tap Flute Design Gives Optimum Chip Removal

LESS breakage and longer tap life are advantages of the high spiral flute design of the Turbo-Cut tap. Chips are moved away from the cutting edge in fast and easy stages.



In a field test, aluminum grommets were tapped ⅜ in. deep at a rate of 70 pieces a minute. The 10-24 Turbo-Cut tap was still usable after threading 18,000 holes.

Other tests have shown that the tools give excellent performances in other ductile materials, stainless steel, and plastics. They provide optimum chip removal without sacrifice of accuracy.

For more information, *write* Threadwell Tap & Die Co., Greenfield, Mass.

NEW literature

Write directly to the company for a copy

Alligator Shear Hazard Survey

An 8-page booklet lists 22 safety suggestions for operators of alligator shears and describes accidents that have occurred. Institute of Scrap Iron & Steel Inc., 1729 H St. N.W., Washington 6, D. C.

Uses of Sodium Bisulfite

A booklet gives the physical properties, typical analyses, and industrial uses of sodium bisulfite. Inorganic Chemicals Div., Monsanto Chemical Co., 800 N. Lindbergh Blvd., St. Louis 66, Mo.

Butyl Rubber Compounds

Two booklets describe the resistance of Butyl rubber compounds to ozone and to fire-resistant hydraulic fluids. No. 105-1 and 102-1. Thiokol Chemical Corp., 780 N. Clinton Ave., Trenton 7, N. J.

Stainless Steel Machining Data

This bulletin covers feeds, machining speeds, and grades of carbide cutting edges best suited for roughing, semifinishing, and fine finishing stainless steel Types 201 to 502. Dept. SS, Kennametal Inc., Latrobe, Pa.

How To Combat Abrasive Wear

"The Role of Molybdenum in Abrasion Resistant Materials," 36 pages, describes what abrasive wear is, its economic significance, and how to combat it with molybdenum-containing materials. Climax Molybdenum Co., division of American Metal Climax Inc., 500 Fifth Ave., New York 36, N. Y.

Protective Coatings

A simplified chart helps you select phenolic, rubber, polyethylene, vinyl, and epoxy coatings by service requirements. Physical properties and chemical resistance are listed. Bulletin 100. Carboline Co., 32 Hanley Industrial Court, St. Louis 17, Mo.

Roller Gravity Handbook

"Roller Gravity by Lamson," explains the application of gravity conveyors and the more common accessories. Charts and graphs are included to assist the engineer in matching a conveyor to the loads. Lamson Corp., Syracuse 1, N. Y.

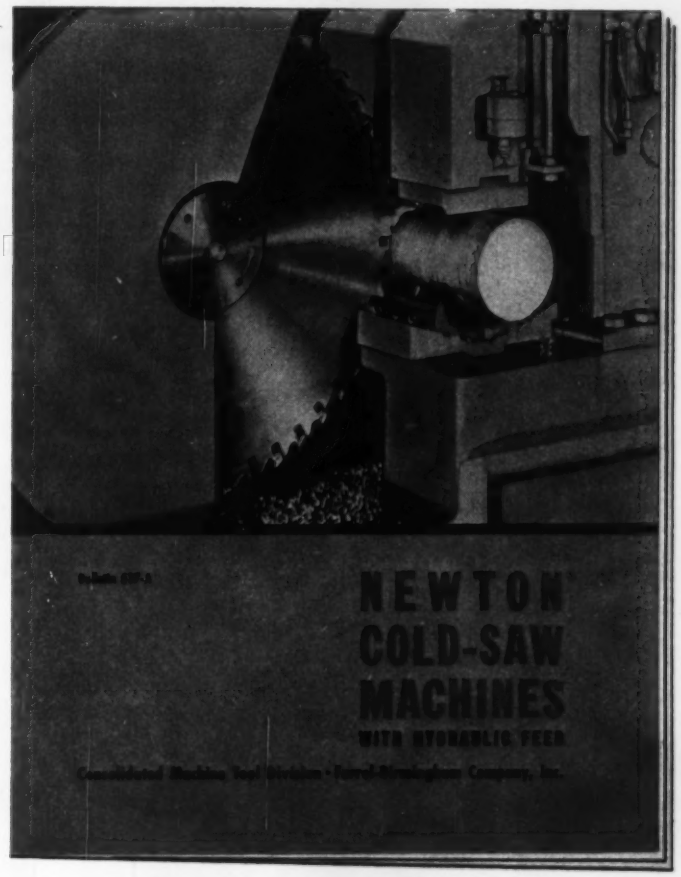
Handling Application Story

User reports show dollar savings realized through the proper application of this firm's narrow aisle trucks. User Report #21. Raymond Corp., 91-171 Madison St., Greene, N. Y.

Stainless Welding Fittings

Information on how to choose stainless welding fittings and flanges is included in a 54-page booklet that lists complete technical data on this company's line of products. TT600. Tube Turns Div., Chemetron Corp., Louisville 1, Ky.

Whether you cut ferrous or nonferrous metals



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Newton cold saws are specialized machines, built to individual needs. Cutting speed, spindle horsepower, type of spindle drive and design of work-clamping device are determined by specific requirements. Manufactured in a wide variety of sizes, they are available in two types: heavy-duty machines for cutting ferrous metals or high-speed machines for cutting nonferrous metals. Special dual-purpose machines are built to perform a second operation, in addition to cutting.

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JUST AS A WEDGE DRIVEN INTO A LOG is held tightly by pressure . . . the wedge-action contacts of G-E 100-Line magnetic starters move into position with *less bounce*. Result: less arcing and longer contact life.

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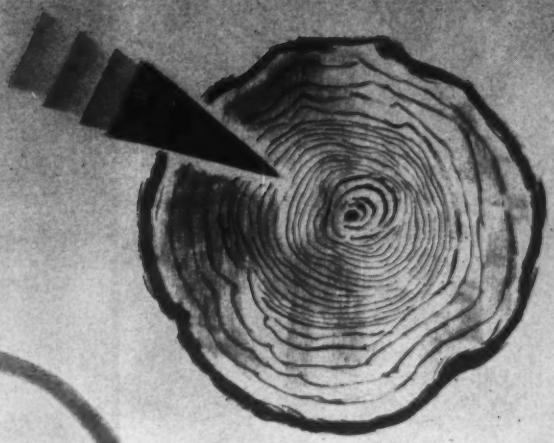

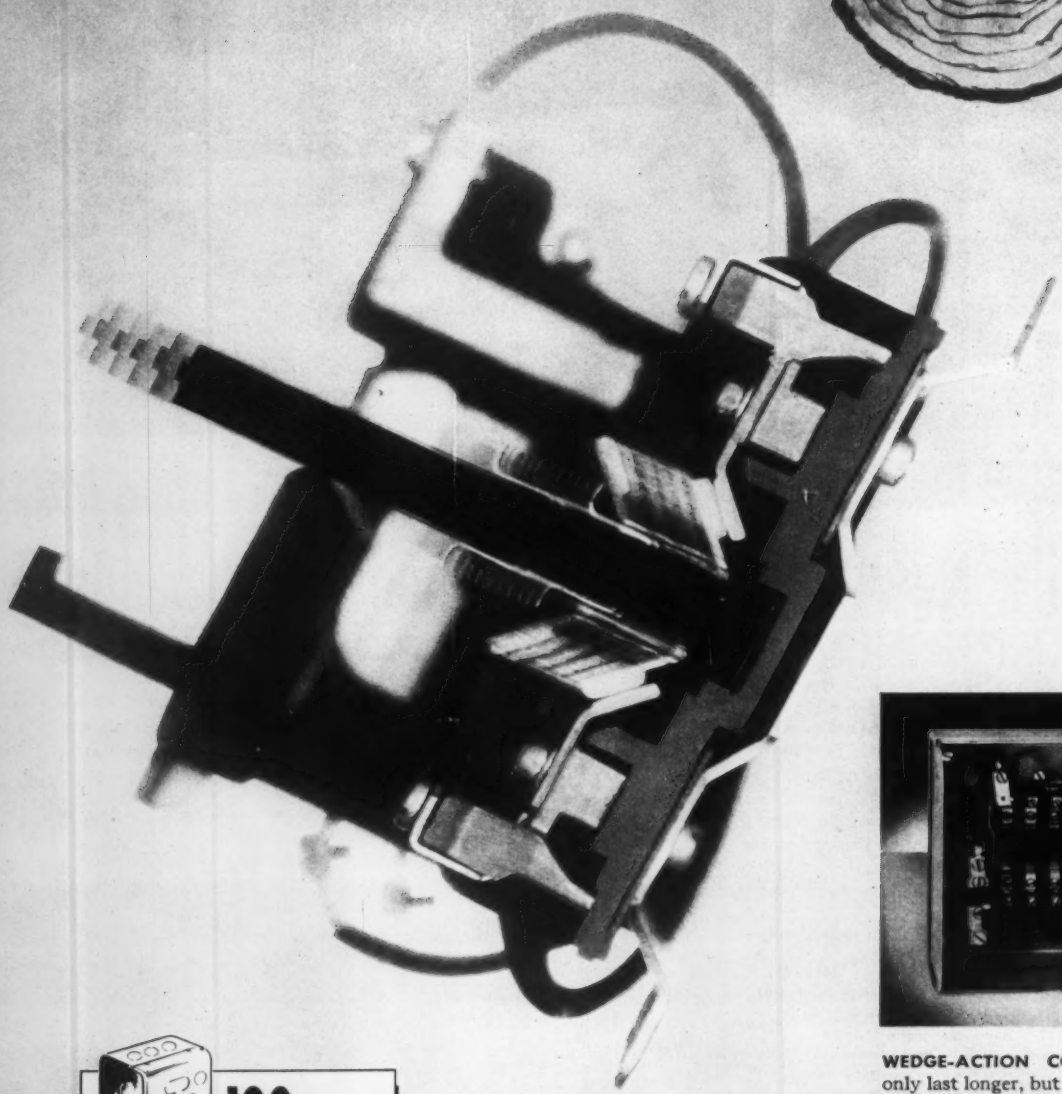

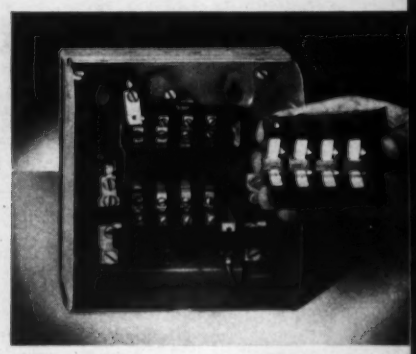

WEDGE-ACTION CONTACTS not only last longer, but can be visually inspected in 10 seconds *without* tools. Contact maintenance is thus held to the minimum.

contributes to G-E 100-Line magnetic starters'...

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The basic function of a magnetic starter is simply to open and close contacts. The better it performs this function, the greater its reliability. Here's why General Electric's 100-Line starter contact design gives you ***better*** contact fidelity and ***longer*** contact life:

POSITIVE "MAKE"—wedge-action contacts can move only forward and back; lateral movement is virtually impossible. This assures perfect contact alignment, positive "make," and longer contact life.

LESS BOUNCE—less armature mass and spring-loaded contacts that absorb the shock of contact mean minimum bouncing or arcing—the major cause of contact failure. Spring-loaded contacts also help prevent contact welding and assure high tip pressure.

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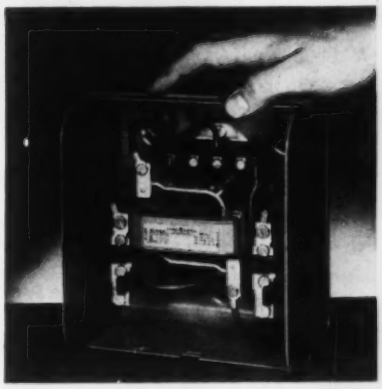
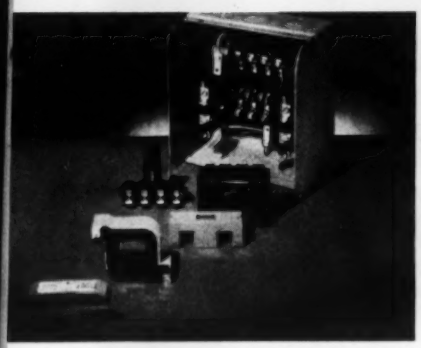
LESS CONTAMINATION—because of their vertical slant design, G-E 100-Line starter contacts shrug off dust and dirt—help keep starter performing better.

FOR BETTER PERFORMANCE AND LESS MAINTENANCE, specify G-E 100-Line magnetic starters—Sizes 0 and 1. Call your G-E Apparatus Sales Office or Distributor, or write Section 733-44, General Electric Co., Schenectady, N. Y.

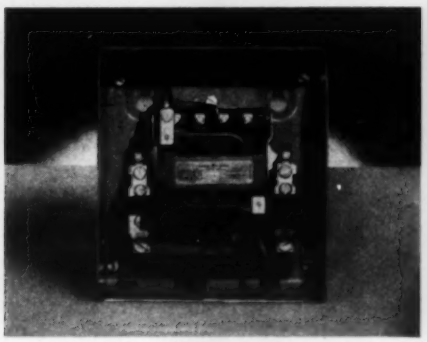
GENERAL ELECTRIC



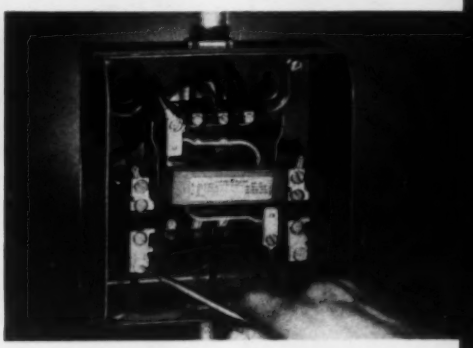
GENERAL ELECTRIC 100-LINE STARTERS are available in Sizes 0 and 1 with a wide variety of forms and enclosures.



SNAP-SLIDE CONSTRUCTION permits complete starter disassembly in 20 seconds without tools. All operating parts either snap or slide together for maximum accessibility.



32% MORE WIRING ROOM makes the G-E 100-Line starter easier to wire, even though it's smaller in size than previous forms. Wrap-around cover adds extra accessibility.



STRAIGHT-THROUGH WIRING with line terminals on top and load terminals on bottom saves wiring time. All wiring is done from front, and no wires need be bent or looped.

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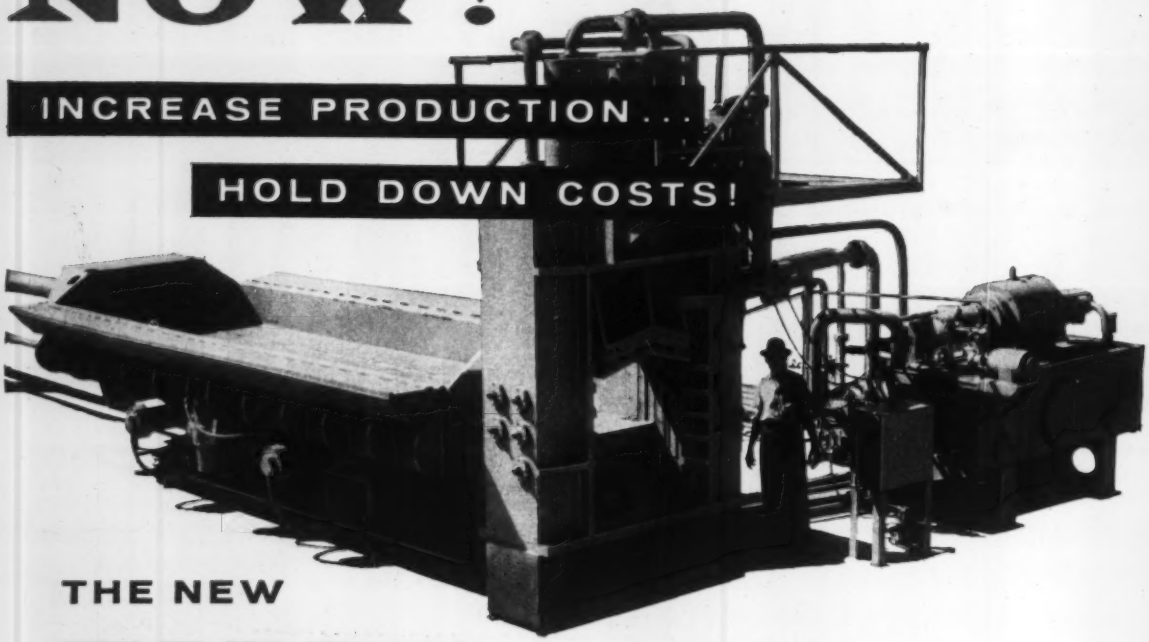
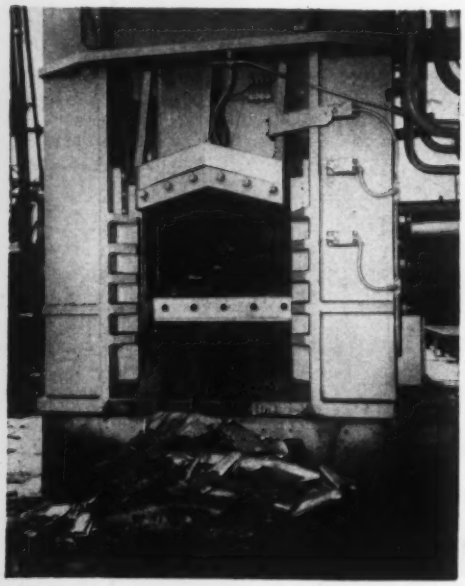


THE NEW

HARRIS BS-350 BALER-SHEAR

AUTO FRAMES and bulky scrap work through easily. The Harris Baler-Shear was designed to eliminate problems arising from the preparation of bulky scrap. It incorporates the principles of baling and shearing.



SPECIFICATIONS

size of charging box	264 x 83 x 41"
shear opening height	20"
shear opening width	36"
shear force	350 tons
floor space required	55' x 20'

HARRIS FOUNDRY & MACHINE CO.

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▶ *Talk with a Man from Harris*

February 23, 1959

Weekly Output Will Soon Set Record

STEELMAKERS will set at least one production record during the first half of 1959; they may set two. They're bearing down on a weekly record now. Last week, they boosted their operations 2.5 points (to 86 per cent of capacity) and turned out 2,440,000 net tons of steel for ingots and castings. That's only 85,000 tons less than they produced in the record week of Dec. 17, 1956. They'll break the old standard (2,525,000 tons) as soon as their operations reach 90 per cent of capacity.

A first half production record may also be attained (see Page 45), but not without some fast stepping. To beat the mark established in the first half of 1956 (62.6 million tons), steelmakers will have to run their furnaces at 90 per cent of capacity for the next four months.

BACKLOGS BALLOON— In the last few weeks, mills have been flooded with orders that reflect continued improvement in the business outlook and growing anxiety about a midyear steel strike. A large eastern producer attributes 35 per cent of its current bookings to strike fever. Whatever the basis for the buying rush, orders are accumulating faster than they can be processed. Since Jan. 1, Jones & Laughlin Steel Corp.'s backlog has doubled. It's the largest in the company's history.

AUTOMAKERS STOCK UP— Although they're beginning to feel that the odds are against a steel strike, automakers are gradually expanding their inventories. Fisher Body Div. of General Motors Corp., says its supplies are still low (15 to 20 days), but big orders have reportedly been placed for April and May delivery. By June 1, Fisher is expected to have enough steel in stock to complete its 1959 models and start on the 1960s.

SHEET MILLS RUNNING FULL— Producers of flat-rolled products are running their mills at capacity and have little tonnage open for the first half. In some cases, they've probably booked more business than they'll be able to handle by July 1. If there's no strike, steelmakers hope some of the orders they've accepted can be carried into the bleak months of July and August.

BARS IN BETTER DEMAND— February bookings of hot-rolled bar producers are running 25 to 30 per cent ahead of last month's. Among the most active buyers are automotive suppliers, fastener manufacturers, forgers, farm implement makers, and converters. Cold drawers also report brisk sales. A midwestern firm is sold out through the first half and has orders for delivery in the third quarter.

TUBULAR PRODUCTS GAIN— Oil companies are going "hog wild" in their efforts to replenish low inventories of tubing and casing, steelmakers report. Since drilling activity hasn't picked up appreciably, it's apparent that most of the buying is of the strike hedge variety. Users will accept first quarter delivery of any material ordered for the first half. Several mills booked twice as much tonnage in January as they entered in December. They're almost sure to operate at capacity for the next four months. Products in greatest demand include large diameter casing and specialties.

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*Current prices were published in the Feb. 16 issue and will appear in subsequent issues.

Accurate casting of this 40-lb. rear end housing cuts machining at Auto Specialties.

Quality Controlled HANNA SILVERY... Simplifies Consistent Production of Quality Controlled Castings at Auto Specialties

Much of Auto Specialties Manufacturing Company's fine reputation has been built on the high quality malleable castings produced in huge quantities at its St. Joseph, Michigan, foundry. An important factor in this continuous high quality story is the use of Hanna Silvery. Its dependable analysis plays a major role in the close silicon control of cupola-electric furnace duplexing of malleable, so necessary in the manufacture of precision automotive parts.

Whether they are housings or gears, sprockets, universal joints or clutch plates, quality controlled Hanna Silvery is of vital assistance in maintaining the exacting chemical composition necessary to production of precision castings time after time. This record is substantiated by a million-volt X-ray machine, a part of Auto Specialties quality control system, which spot checks castings for uniformity and accuracy.

Hanna produces high quality pig iron for every foundry need. All regular grades, plus close-grain HannaTite, are available in 38-pound pigs and HannaTen ingots. Trained representatives are ready to help with your metallurgical problems. For assistance, call Hanna today.

Millions of perfect castings at Auto Specialties pass under the eye of this X-ray machine.

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Buffalo • Detroit • New York • Philadelphia
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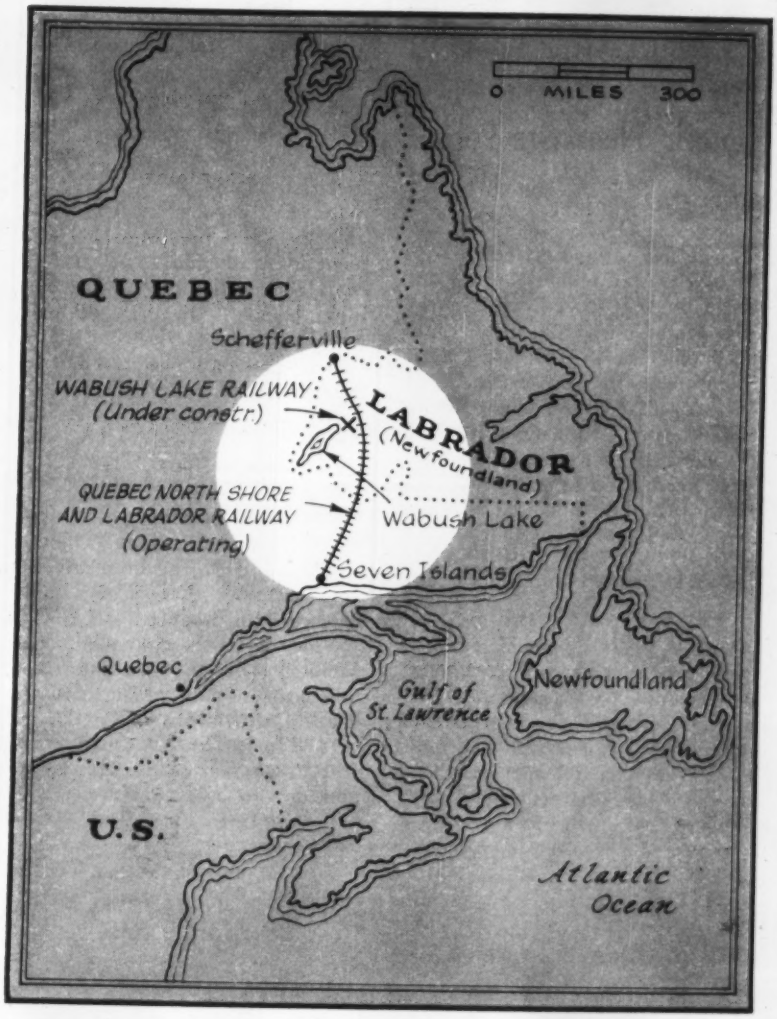


Javelin Sells Wabush Stock

PICKANDS MATHER & CO., Cleveland, has acquired the 10 per cent interest in Wabush Iron Co. and Wabush Lake Railway Co., Labrador, held by Canadian Javelin Ltd., Montreal, Que. The move should speed development of the Wabush Lake iron ore region.

It will be the third major mining project in the ore rich "Labrador Trough." Other projects are the Schefferville (Knob Lake) mine of the Iron Ore Co. of Canada, Toronto, Ont., and Quebec Cartier Mining Co.'s (a U. S. Steel Corp. subsidiary) development between Mt. Wright and Mt. Reed to the southwest of Wabush Lake.

• **Ore Content Proved** — Canadian Javelin has a 99 year lease to explore and remove all minerals, plus other surface rights in an area near Wabush Lake. In 1957, Pickands Mather first leased the Javelin property. It said construction of ore concentrating plants and other facilities would take two to four years after the ore body was thoroughly explored and its extent proved. (Javelin has proved 1.2 billion tons of ore in the region.)

Mather plans to finish construction of the Wabush Lake Railway. Most of the 42 mile roadbed was cleared and several miles prepared for track by Javelin. The road runs east from Wabush Lake, connecting with the Quebec, North Shore & Labrador Railroad which runs from Schefferville to Seven Islands (see map). From Seven Islands, ore will be shipped to the U. S., Canada, and Europe.

• **Payments Involved** — Pickands Mather paid $275,000 for the 10 per cent interest. It also agreed to pay a royalty per ton of ore mined. The ultimate value of the transaction could reach $28.5 million over a period of many years if the property lease is not surrendered. An additional $725,000 was paid for other modifications of the Wabush Iron Co. agreements.

All agreements can be canceled at any time on short notice, terminating all obligations, royalties, and further stock purchase payments.

Other owners of Wabush Iron Co. include: Steel Co. of Canada Hamilton, Ont.; Youngstown Sheet & Tube Co., Youngstown; Interlake Iron Co., Cleveland; and Mather Iron Co., Cleveland.

We're Mineral Rich

Kennecott executive, once with Bureau of Mines, hits 'climate' that discourages exploration

AN ANSWER to alarmists who charge that extractive industries are exhausting the country's mineral wealth is offered by James Boyd, vice president, exploration, Kennecott Copper Corp.

The answer: "With few exceptions, usable mineral materials are present in the earth's crust in such enormous quantities as to defy any ordinary combination of social and economic events to exhaust them."

• **Expanding Deposits**—Mr. Boyd points out that the mining process itself has shown many mineral ore deposits to be larger than was suggested by surface observation. "The original concept of their size is almost invariably an underestimate," he says.

Improved technology is also accounting for important new discov-

eries. For example, lead was once thought to be a vanishing commodity. But we have located a vast mining district which rivals the original Missouri deposits (once the primary world source). The deposits, which are more than 1000 ft deep, gave no surface clue of their presence.

• **Limiting Politics**—More alarming than ore depletion, Mr. Boyd says, is the political climate which discourages exploration in the U. S., while other countries foster active prospecting. In Canada, for example, the finder of a mine is not taxed for three and one-half years after production begins; if he decides to sell his discovery, he pays no capital gains tax like ours. In Latin-America, private incentives have produced a booming petroleum industry in Venezuela.

Mr. Boyd cites an example of the attitude toward exploration in this country. Say an explorer takes advantage of provisions of the depletion laws—he's able to write off exploration costs against other income. The benefits, which were designed to stimulate exploration, are now considered "loopholes" in the law, he says.

Ontario Plans Ore Port

Plans are underway for direct shipment of minerals from deposits in northern Quebec, Labrador, and the Belcher Islands (reported to contain over 1 billion tons of low grade iron ore) to southern Ontario. The Ontario government proposes to develop a $5 million port at Moosoonee, Ont., on Moose River, 15 miles inland from James Bay.

Moosoonee (population: 1000) is the northern terminus of the Ontario Northland Railway which connects with the Canadian National and Canadian Pacific Railways.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 122 & 123

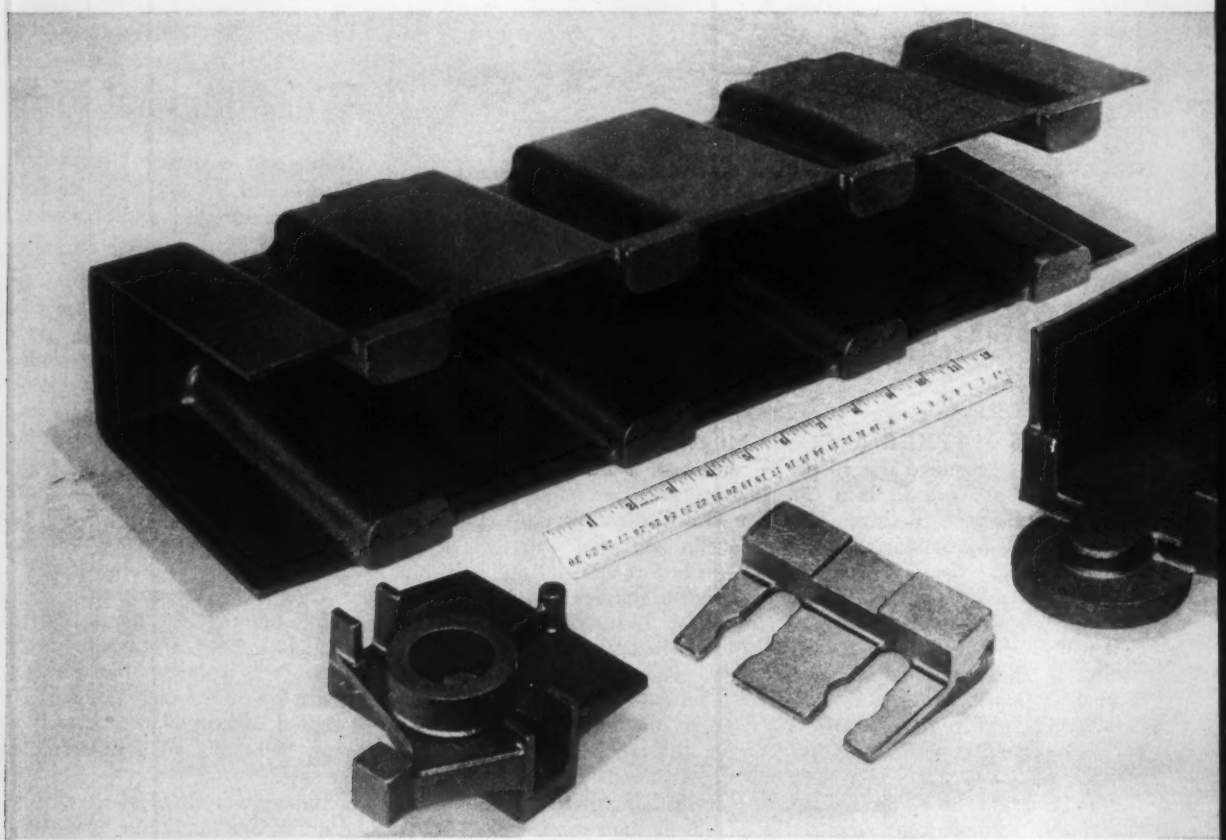
Although sheet demand is heavy, most producers' regular customers will be fully protected for the first half on tonnage that conforms with normal buying patterns. The mills have little open tonnage for others, though. This is particularly so with regard to galvanized and cold-rolled sheets.

The sheetmakers are not so tightly committed on hot rolled and specialties (electrical sheets and enameling stock), but they're screening inquiries closely.

Broadly, regular customers are able to obtain hot rolled for shipment in April, and cold rolled for May. Some mills, though, are running behind on their shipment promises, particularly cold rolled. Certain of them are so heavily committed ahead they're confident they'll have all of the tonnage they can handle on all grades from now until the end of June.

Current buying is mostly for inventory, and as a hedge against a possible strike this summer. Actually, forward buying of sheets and strip surpasses that of any other finished steel product.

Ordering by the automobile companies is stable. But the auto situation bears watching. The industry, it's said, should be building 25 per cent more cars than at this time last year, if original production projections are to be met. However, it's



doing only 10 to 11 per cent better. Some recent layoffs in auto plants may be a signal that business is not developing the volume that had been expected.

Automobile builders' inventories of steel are estimated sufficient for 40 to 45 days. This compares with 20 to 30 days normally.

There's a feeling in the market that Ford is building more inventory than General Motors. It's figured if February-March sales don't pick up as expected, the auto people may back away from some of the steel they've ordered. Here's a rumor: Ford has asked several mills how much advance notice is needed to cancel orders. Ford will not comment.

Another rumor at Detroit: A large rubber company is financing steel purchases by some of its suppliers.

Among active sheet buyers: Manufacturers of household appliances; shelving; air conditioning equipment; water heaters. The service centers (warehouses) are specifying more freely; farm implement makers are stepping up their buying.

Steel Bars . . .

Bar Prices, Page 121

Distributors, fastener makers, small forge shops, and cold drawers are all contributing to a more active market in bars, particularly hot-rolled carbon grades. Some sellers are reportedly booked well ahead, in one instance through June on cold drawn. This seller is reported committed on tonnage into July and August.

While there's some talk of allocations as demand picks up, volume hasn't reached the point where quotas of any kind are seriously considered. But with buyers ordering more actively for their stepped-up operations as well as for stock, it's possible a situation similar to that in sheets and strip may develop before too long.

Cold-drawn carbon bars are moving better. So far, though, most converters have been able to maintain a good amount of hot stock, and they can make deliveries ranging from a week to six weeks on the standard sizes. Hot alloys are available in five to six weeks, and cold alloys in seven to eight. This represents a tightening in both grades, compared with the situation a month or so ago.

Domestic sellers are encountering foreign competition, particularly at the warehouse level. However, it's restricted largely to the ordinary commercial grades, and is not on nearly as large a scale as the competition offered by foreign reinforcing bars.

More automotive specifications are coming through to sellers, but government requirements for shellwork are tapering. Some ordnance business is being canceled, and one eastern arsenal has withdrawn a tentative inquiry for 10,000 tons of bar stock.

With converters' bookings heavier, a mild bulge in alloy bar demand is noted in New England, particularly for the smaller sizes of cold drawn. In most cases, converters' operations are 10 to 15 points higher than they were recently.

Demand for leaded alloy bars is improving. More mills are producing this grade.

Electro-Alloys shell molded heat- and corrosion-resistant castings open a new range of applications where high dimensional accuracy, reduced machining cost, and superior finish are needed. Write ELECTRO-ALLOYS DIVISION 1013 Taylor Street, Elyria, Ohio for technical information.

AMERICAN Brake Shoe COMPANY

Distributors . . .

Prices, Page 125

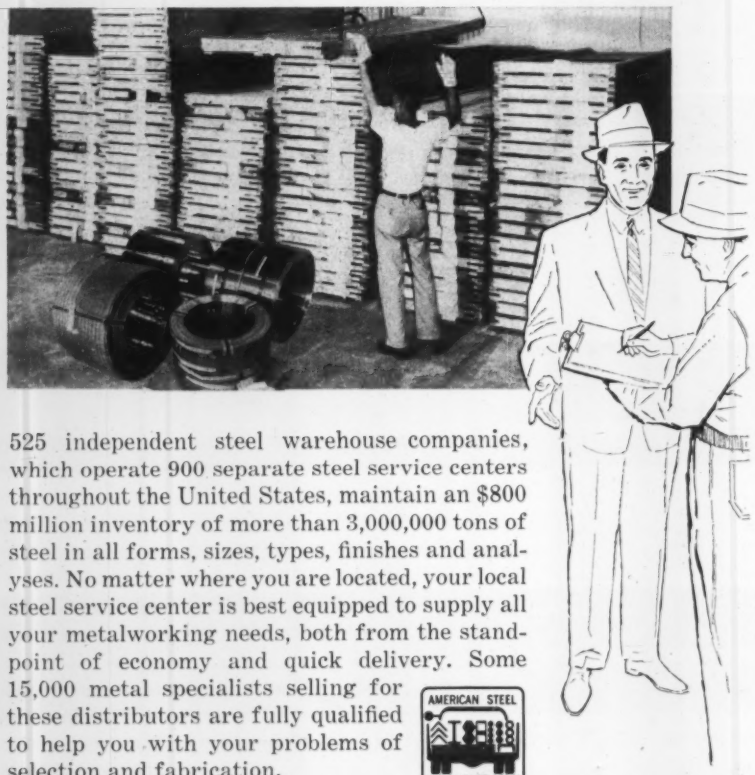
Business of the steel service centers is improving but is spotty as to products and localities. In the St. Louis district, for instance, bookings rose about 10 per cent last month and are maintaining that rate this month. In Philadelphia, no real improvement is in sight.

Where business has picked up, galvanized, hot, and cold-rolled sheets are in the best demand. Structurals are generally slow, and plates are only a little more active. Any sharp gain in shipments from service centers will likely be a signal that consumers are not getting all the material needed for current needs from the mills.

In spite of the lower prices being asked for Japanese wire, German nails, and other imported wire products, Edward Landsberg, president, Master Supply Co., Atlantic City, N. J. says he will continue to buy and sell only American made products. His firm maintains four builders' supply warehouses in New Jersey which handle a large volume of wire products used by the building trades.

"There is more to a product—and a business—than merely its price. Quality is an important consideration. So are service and the reputation for on-time delivery," Mr. Landsberg says. "We have an obligation to safeguard our customers' source of supply. And the only way we can do this is to safeguard our own."

The best place to get the steel you want when you want it— is your LOCAL STEEL SERVICE CENTER



525 independent steel warehouse companies, which operate 900 separate steel service centers throughout the United States, maintain an $800 million inventory of more than 3,000,000 tons of steel in all forms, sizes, types, finishes and analyses. No matter where you are located, your local steel service center is best equipped to supply all your metalworking needs, both from the standpoint of economy and quick delivery. Some 15,000 metal specialists selling for these distributors are fully qualified to help you with your problems of selection and fabrication.

AMERICAN STEEL WAREHOUSE ASS'N

STAINLESS STEEL is stocked in 252 of these Steel Service Centers, many of which carry MICROROLD Stainless sheet and strip made by the Washington Steel Corporation.

WASHINGTON STEEL CORPORATION

WASHINGTON STEEL CORPORATION

22-O Woodland Avenue • Washington, Pennsylvania

Tubular Goods . . .

Oil companies are actively replenishing their low inventories of tubing and casing. Since drilling hasn't picked up appreciably, most of the new buying is deemed to be hedging against a possible steel strike. Users say they'll accept first quarter delivery of all the tonnage they've ordered for first half.

Several mills booked twice as much tonnage in January as they entered in December. They're almost sure to operate at capacity the next four months. Products in greatest demand include large diameter (over 7⅝ in.) casing and specialties.

Downriver distributors are increasing their inventories. Reasons: 1. They anticipate more drilling this year than last. 2. They want to earn the 4 per cent discount that applies to pipe shipped into their yards. 3. They believe steel prices may rise in the wake of the labor settlement after midyear.

Demand for standard pipe is better, consumption rising with improvement in weather conditions. Distributors are starting to rebuild inventories. They're ordering for May and June delivery.

Line pipe sales are also on the upgrade. Producers attribute gains to a pickup in trunk pipeline construction.

The improved outlook for demand is being reflected in higher steel operations. Sharp increases in orders for seamless and standard pipe are reported by Youngstown makers. Republic Steel and Youngstown Sheet & Tube are major producers at that point, but U. S. Steel's Ohio Works there is rolling skelp for U. S. Steel's National Tube Div. at Lorain, Ohio, which plant

is rushed with orders for pipe of various classifications.

Plates . . .

Plate Prices, Page 121

The Claymont, Del., mill of the Wickwire Spencer Steel Div., Colorado Fuel & Iron Corp., has booked an order for 50,000 tons of 24-in. pipe for the Argentine government. The tonnage will fill requirements for 260 miles of an 1100-mile gas pipeline extending from the Campo Duran fields to Buenos Aires.

The purchase order was signed for the Argentine government by the North American Utility & Construction Corp., through A. F. Axelrod Co. Inc., both of New York.

After a slow start this year, eastern plate demand is picking up rapidly. Actual consumption is still spotty and is not too heavy, but considerable buying for inventory is reported. Producers, however, are screening orders carefully with a view to discouraging overspeculation. Most believe they will have no difficulty in sustaining high operations through March and the second quarter.

Makers of sheared plate are filling their first quarter books, and they report increasing demand for April and May shipments. Rebuilding of inventories is thought to be largely protective against possible shortages in event of a midyear steel strike. However, some improvement is noted in consumption, notably in tank and railroad shops, and to some extent in construction. Ship needs continue prominent in the market picture.

Two major water projects in the Pacific Northwest will take 20,000 tons of plates. Bids are in at Seattle for the Tolt River pipeline, involving 18,855 tons, while Everett, Wash., will open bids Feb. 26 for 2000 tons or more of 1/4 in. pipe plate.

Partial naval shipyard second quarter requirements, 15,000 tons, close between Feb. 24 and Mar. 3. High tensile, carbon hull and floor plates are included. The Navy has also given a contract to Babcock & Wilcox Co. for improvement of weldability of the Hy-80, high tensile grade.

Lack of fabricated tonnage projects and backlogs, including tank and weldment volume, retards forward buying by New England shops.

Sheared plate shipments can be made in three to four weeks by eastern Pennsylvania mills, and limited forward buying, beyond April, is largely held to specialties. Shipments of flange work and heads are in line with plate deliveries.

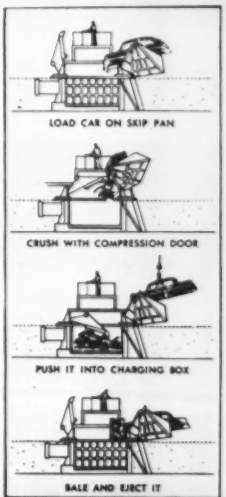
Wire . . .

Wire Prices, Pages 123 & 124

There's a little more buying in the wire market, but over-all demand is sluggish compared with that in some other products, notably sheets and strip. March bookings are about 15 per cent heavier than February's in New England.

Some hedge buying for April and beyond is noted in cold heading, spring, and manufacturers' wire. But deliveries are not much more extended than they have been. What forward buying is being done appears to be generated as much by fear of higher prices later this year as the threat of supply shortage in

New Power Packed "750 CS" Bales Car Bodies in Just 3 Minutes



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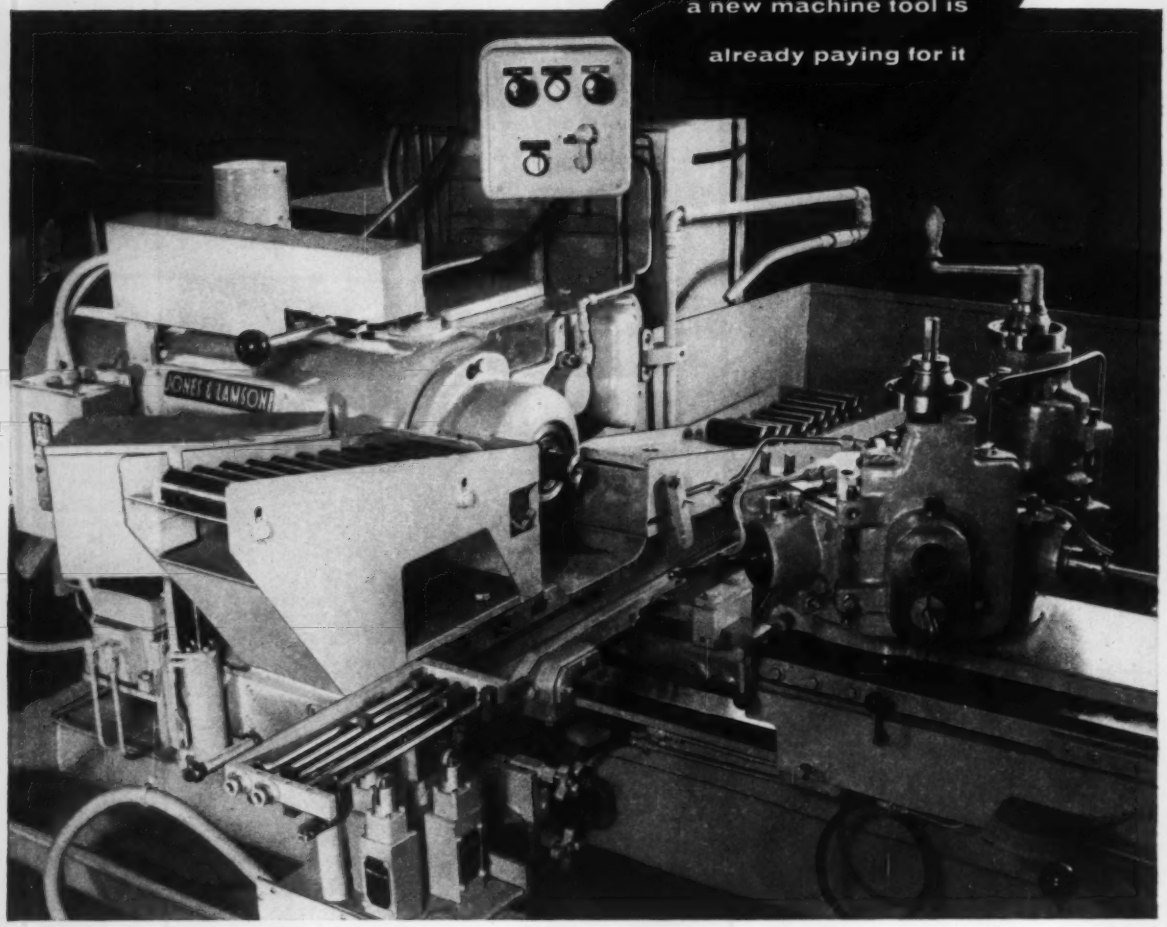

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This J & L Automatic Ram Type Turret Lathe with Lynn Hydraulic drive provides completely automatic operation from start to stop. A magazine feed for automatic work handling has been mounted on the cross slide. However, on applications where cross slide tooling is necessary, handling devices can be arranged that will free either the front or rear of the cross slide for tooling.

Fourteen similar parts of varying dimensions are produced on this same machine. The tooling used is basically the same as that used in the former, hand-operated method. However, on machining time alone, costs are reduced by 32%. Operator attention for this set-up is only one-third of that previously required. In addition, studies show that one operator can run two or more of these automatics with less fatigue than is involved in running one manual machine. Needless to say, J & L's long-standing reputation for turret lathe accuracy is retained throughout. Write for catalog 5808. Jones & Lamson Machine Company, 517 Clinton Street, Springfield, Vermont.

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event of a midyear steel strike.

Demand is definitely for inventory buildup rather than heavier current consumption. A leading producer at Pittsburgh expects buying to spurt in March, especially for merchant products.

The Navy purchased several hundred tons of welding electrodes from four producers, the largest share, 205 tons, going to Air Reduction Co. Inc., New York.

Pig Iron . . .

Pig Iron Prices, Page 125

Merchant pig iron is moving at a slightly improved rate, although demand so far this year has been disappointing, lagging far behind that for steel.

Merchant iron sellers look for a busy second quarter as foundries step up buying in advance of the strike deadline.

Blast furnace operators are increasing operations steadily to keep pace with the gain in steel production. United States Steel Corp. has relighted No. 5 blast furnace at the Edgar Thomson Works, Braddock, Pa. This brings to six of seven the number of furnaces in operation at that plant. No. 5 furnace had been taken out of production in January, 1957.

National Tube Div. relighted its No. 1 furnace at the National Works, McKeesport, Pa., bringing to two the number in operation out of a total of four. The No. 1 furnace was taken out of production on Dec. 31, 1957. Since then, it has been relined and modernized. Its hearth diameter has been enlarged from 23 to 24 ft, increasing its capacity from 831 tons to 1013 tons of iron a day.

Youngstown Sheet & Tube Co. relighted its No. 5 stack at South Chicago (Ill.) Works Feb. 15. This makes 39 out of 43 blast furnaces that are now active in the district. It is the largest number since March, 1957, when 41 were active.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 122

The weakness in concrete reinforcing steel bars is in the fabricating-distribution area of the market. Mill prices are firm, and contractors are holding quotations on bars in place. But competition for tonnage among distributors, notably in New England, has forced some sellers out of the market. This is particularly true on bridge tonnage with contractor buyers hammering prices down.

Tonnages being placed and estimated are slightly heavier, but the big bulge in buying is not expected until the seasonal upswing in construction starts in the spring.

The outlook for second quarter business is generally promising. Substantial tonnage is pending before the market, including 5900 tons for the Washington State second Lake Washington floating bridge, 1600 tons for Seattle's Tolt River dam, 2500 tons for freeway bridge approaches at Seattle, and 1165 tons for the bridge superstructure at that point.

Imported bars continue to furnish sharp competition to the domestic product. In fact, imported prices are a major factor in price weakness at the distributor level.

Atlantic's Strike Ended

Atlantic Steel Co., Atlanta, closed by a strike since last Oct. 31, resumed operations Feb. 16 after an agreement with the United Steelworkers of America was reached. It establishes definite job classifications and lines of promotion in each classification, based on seniority. Wages were not involved.

The company announced it will reactivate its blast furnaces, idle the last two years. Capacity of the blooming mill is only sufficient to handle production of the electric furnaces.

About 1300 employees were idled by the strike, which lasted 103 days. Payroll losses exceeded $1.5 million.

Stainless Steel . . .

Production of stainless and heat resisting steel ingots last year totaled 892,984 tons reports the American Iron & Steel Institute. It compares with 1,000,357 in 1957, and 1,210,569 in 1956.

Fourth quarter output amounted to 300,522 tons, vs. 213,283 tons in the preceding quarter and 206,624 in the corresponding quarter of 1957. In the last quarter of 1956, output was 360,823 tons.

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Bauxite Supply Will Last for Years

THE ALUMINUM industry has enough ore reserves for many generations to come, reports Walter L. Rice, president, Reynolds Mining Corp. and vice president, Reynolds Metals Co., Richmond, Va.

Mr. Rice says the development of processes for economically refining low grade ores has given the industry wider scope in its search for new reserves.

• **More Competitive**—"Rising costs and new processes will, perhaps in a decade or two, make North America's abundance of bauxite substitutes competitive with bauxite from overseas," he predicts. "One producer reports it has developed a process for economically using high alumina clay which is plentiful in our northwestern and southern states." Recent finds indicating huge bauxite deposits in Africa, Australia, and Asia foreshadow "a growing trend to utilize bauxites found in distant corners of the Free World," he adds.

Mr. Rice called Paley report forecasts for light metals too conservative. The Paley committee, part of the President's Materials Policy Commission which made a 25 year forecast in 1950, said consumption in 1975 would be about 4.5 million tons. He says projections by his company indicate it will be closer to 10 million tons, five times present usage.

He states that other light metals —magnesium, titanium, and zirconium — are also fulfilling or outdistancing the rates of growth estimated by the Paley report.

• **Outlook**—Mr. Rice envisions giant ocean carriers transporting 100,000 tons of bauxite between continents as cheaply as ores are now shipped between Cleveland and Pittsburgh.

Rails, Cars . . .

Track Material Prices, Page 124

Freight car orders in January increased to 4007 units, vs. 3830 in December and 401 in January, 1958, reports the American Railway Car Institute and the Association of American Railroads.

Backlogs as of Feb. 1 totaled 29,470 units, against 27,596 on Jan. 1 and 55,941 on Feb. 1, 1958.

January deliveries were 1940, compared with 2621 in December, and 7219 in January a year ago.

The New York Central Railroad has ordered 1000 seventy-ton hopper cars from its East Rochester, N. Y., shops. The cars will cost about $8,600,000, with delivery planned for this fall. It was the road's first order in a year.

Steel Ingot Production--January, 1959

Period	OPEN HEARTH (Net tons)	BESSEMER (Net tons)	OXYGEN PROCESS (Net tons)	ELECTRIC (Net tons)	TOTAL (Net tons)	Per cent of capacity
1959						
†January ..	8,281,000	120,000	187,000	724,000	9,312,000	74.3

	—OPEN HEARTH—		—BESSEMER—		—ELECTRIC—		—TOTAL—	
Period	Net tons	Per cent of capacity	Net tons	Per cent of capacity	Net tons	Per cent of capacity	Net tons	Per cent of capacity
1958								
January ..	6,085,124	58.6	121,338	35.5	547,440	44.8	6,753,912	56.5
February .	5,252,112	56.0	81,597	26.4	448,614	40.6	5,782,323	53.6
March	5,598,944	53.9	122,317	35.8	533,361	43.6	6,254,622	52.3
1st Qtr. ..	16,936,180	56.2	325,252	32.8	1,529,425	43.1	18,790,857	54.1
April	4,875,619	48.5	109,433	33.1	547,939	46.3	5,532,991	47.8
May	5,602,123	53.9	110,366	32.3	588,670	48.2	6,301,159	52.7
June	6,378,942	63.4	88,125	26.6	660,413	55.8	7,127,480	61.6
2nd Qtr. ..	16,856,684	55.3	307,924	30.7	1,797,022	50.1	18,961,630	54.0
1st 6 Mo..	33,792,864	55.7	633,176	31.7	3,326,447	46.6	37,752,487	54.1
July	5,712,587	55.0	114,218	33.4	615,600	50.4	6,442,405	53.9
August ...	6,481,185	62.4	134,435	39.3	692,383	56.6	7,308,003	61.1
September..	6,769,660	67.3	103,194	31.2	759,518	64.2	7,632,372	66.0
3rd Qtr. ..	18,963,432	61.5	351,847	34.7	2,067,501	57.0	21,382,780	60.3
9 Mo.	52,756,296	57.7	985,023	32.7	5,393,948	50.1	59,135,267	56.2
October ...	7,795,541	75.0	148,458	43.4	895,779	73.3	8,839,778	74.0
November..	7,572,555	75.3	145,867	44.1	850,896	71.9	8,569,318	74.1
*December .	7,755,002	74.6	116,637	34.1	838,883	68.6	8,710,522	72.9
*4th Qtr. .	23,123 098	75.0	410,962	40.5	2,585,558	71.3	26,119,618	73.6
*2nd 6 Mo.	42,086,530	68.3	762,809	37.6	4,653,059	64.1	47,502,398	67.0
*Total	75,879,394	62.0	1,395,985	34.7	7,979,506	55.4	85,254,885	60.6

Note—The percentages are based on annual capacities as of Jan. 1, 1959: Open hearth, 126,528,380 net tons; bessemer, 3,577,000 net tons; basic oxygen process, 4,033,160 net tons; electric and crucible, 13,495,130 net tons. Total: 147,633,670 net tons. In 1958, the capacity tonnages were: Open hearth, 122,321,830 net tons; bessemer, 4,027,000 net tons; oxygen process, electric and crucible, 14 393,740 net tons. Total: 140,742,570 net tons.

*Revised. †Preliminary.

DISTRICT INGOT RATES

(Percentage of Capacity Engaged)

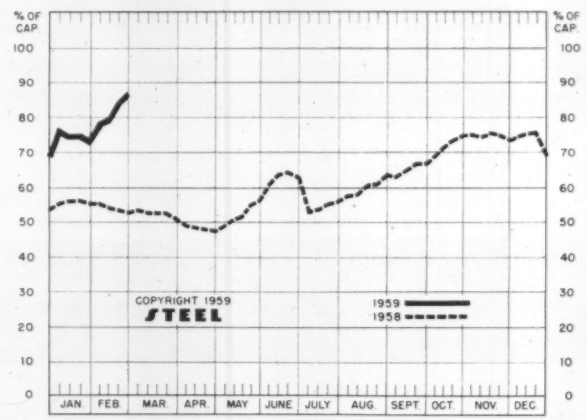
	Week Ended Feb. 22	Change	Same Week 1958	Same Week 1957
Pittsburgh	87	+ 5	56	101
Chicago	89	+ 1	59.5	97
Eastern	85	+ 1	68	98.5
Youngstown	80	+ 5	54	104
Wheeling	87	+ 8	58	101
Cleveland	84.5	+ 1.5*	30	97.5
Buffalo 102.5		+ 2.5	44	107.5
Birmingham	79	+ 6	47	95.5
Cincinnati	97.5	+ 8.5*	50	89
St. Louis	89	— 5	80	98
Detroit	97.5	+ 3.5*	51	102
Western	91	+ 2.5*	63	105
National Rate ..	86	+ 2.5	52.5	97.5

INGOT PRODUCTION‡

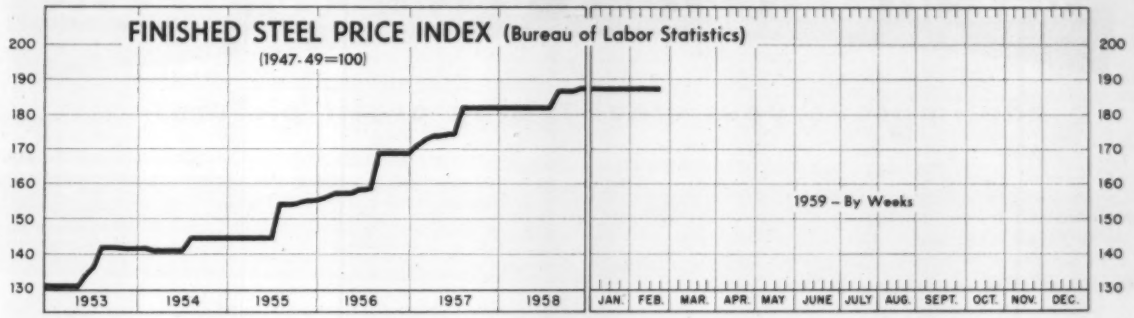
	Week Ended Feb. 22	Week Ago	Month Ago	Year Ago
INDEX ..... (1947-49=100)	151.8†	147.6	128.0	85.5
NET TONS .... (In thousands)	2,439†	2,371	2,056	1,373

*Change from preceding week's revised rate. †Estimated. ‡American Iron & Steel Institute. Weekly capacity (net tons): 2,831,331 in 1959; 2,699,173 in 1958; 2,559,490 in 1957.

NATIONAL STEELWORKS OPERATIONS



Price Indexes and Composites



Feb. 17, 1959	Week Ago	Month Ago	Jan. Avg	Year Ago
187.0	187.0	187.0	187.0	181.7

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended Feb. 17

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them, write to STEEL.

Rails, Standard No. 1	$5.825	Bars, Reinforcing	6.385
Rails, Light, 40 lb	7.292	Bars, C.F., Carbon	10.710
Tie Plates	6.875	Bars, C.F., Alloy	14.125
Axles, Railway	10.175	Bars, C.F., Stainless, 302 (lb)	0.570
Wheels, Freight Car, 33 in. (per wheel)	62.000	Sheets, H.R., Carbon	6.350
Plates, Carbon	6.350	Sheets, C.R., Carbon	7.300
Structural Shapes	6.167	Sheets, Galvanized	8.695
Bars, Tool Steel, Carbon (lb)	0.560	Sheets, C.R., Stainless, 302 (lb)	0.688
Bars, Tool Steel, Alloy, Oil Hardening Die (lb)	0.680	Sheets, Electrical	12.625
Bars, Tool Steel, H.R. Alloy, High Speed, W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.060 (lb)	1.400	Strip, C.R., Carbon	9.489
Bars, Tool Steel, H.R., Alloy, High Speed, W18, Cr 4, V 1 (lb)	1.895	Strip, C.R., Stainless, 430 (lb)	0.493
Bars, H.R., Alloy	10.775	Strip, H.R., Carbon	6.250
Bars, H.R., Stainless, 303 (lb)	0.543	Pipe, Black, Buttweld (100 ft)	19.903
Bars, H.R., Carbon	6.675	Pipe, Galv., Buttweld (100 ft)	23.583
		Pipe, Line (100 ft)	199.53
		Casing, Oil Well, Carbon (100 ft)	201.080
		Casing, Oil Well, Alloy (100 ft)	315.213
		Tubes, Boiler (100 ft)	51.200
		Tubing, Mechanical, Carbon (100 ft)	26.157
		Tubing, Mechanical, Stainless, 304 (100 ft)	205.608
		Tin Plate, Hot-dipped, 1.25 lb (95 lb base box)	10.100
		Tin Plate, Electrolytic, 0.25 lb (95 lb base box)	8.800
		Black Plate, Canmaking Quality (95 lb base box)	7.900
		Wire, Drawn, Carbon	10.575
		Wire, Drawn, Stainless, 430 (lb)	0.665
		Bale Ties (bundles)	7.967
		Nails, Wire, 8d Common	9.828
		Wire, Barbed (80-rod spool)	8.719
		Woven Wire Fence (20-rod roll)	21.737

STEEL's FINISHED STEEL PRICE INDEX*

	Feb. 18 1959	Week Ago	Month Ago	Year Ago	5 Yr Ago
Index (1935-39 avg=100)	247.82	247.82	247.82	239.15	189.74
Index in cents per lb	6.713	6.713	6.713	6.479	5.140

STEEL's ARITHMETICAL COMPOSITES*

Finished Steel, NT	$149.96	$149.96	$149.96	$145.42	$113.91
No. 2 Fdry, Pig Iron, GT	66.49	66.49	66.49	66.49	56.54
Basic Pig Iron, GT	65.99	65.99	65.99	65.99	56.04
Malleable Pig Iron, GT	67.27	67.27	67.27	67.27	57.27
Steelmaking Scrap, GT	42.50	42.50	40.67	37.17	26.83

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130

Comparison of Prices

Comparative prices by districts in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	Feb. 18 1959	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bars, H.R., Pittsburgh	5.675	5.675	5.675	5.425	4.15
Bars, H.R., Chicago	5.675	5.675	5.675	5.425	4.15
Bars, H.R., deld. Philadelphia	5.975	5.975	5.975	5.725	5.302
Bars, C.F., Pittsburgh	7.65*	7.65*	7.65*	7.30*	5.20
Shapes, Std., Pittsburgh	5.50	5.50	5.50	5.275	4.10
Shapes, Std., Chicago	5.50	5.50	5.50	5.275	4.10
Shapes, deld., Philadelphia	5.77	5.77	5.77	5.545	4.38
Plates, Pittsburgh	5.30	5.30	5.30	5.10	4.10
Plates, Chicago	5.30	5.30	5.30	5.10	4.10
Plates, Coatesville, Pa.	5.30	5.30	5.30	5.10	4.10
Plates, Sparrows Point, Md.	5.30	5.30	5.30	5.10	4.10
Plates, Claymont, Del.	5.30	5.30	5.30	5.10	4.10
Sheets, H.R., Pittsburgh	5.10	5.10	5.10	4.925	3.925
Sheets, H.R., Chicago	5.10	5.10	5.10	4.925	3.925
Sheets, C.R., Pittsburgh	6.275	6.275	6.275	6.05	4.775
Sheets, C.R., Chicago	6.275	6.275	6.275	6.05	4.775
Sheets, C.R., Detroit	6.275	6.275	6.275	6.05-6.15	4.975
Sheets, Galv., Pittsburgh	6.875	6.875	6.875	6.60	5.275
Strip, H.R., Pittsburgh	5.10	5.10	5.10	4.925	4.425
Strip, H.R., Chicago	5.10	5.10	5.10	4.925	3.925
Strip, C.R., Pittsburgh	7.425	7.425	7.425	7.15	5.45
Strip, C.R., Chicago	7.425	7.425	7.425	7.15	5.70
Strip, C.R., Detroit	7.425	7.425	7.425	7.25	5.45-6.05
Wire, Basic, Pittsburgh	8.00	8.00	8.00	7.65	5.525
Nails, Wire, Pittsburgh	8.95	8.95	8.95	8.95	6.55
Tin plate (1.50 lb) box, Pitts.	$10.65	$10.65	$10.65	$10.30	$8.95

*Including 0.35c for special quality.

SEMIFINISHED STEEL					
Billets, forging, Pitts. (NT)	$99.50	$99.50	$99.50	$96.00	$75.50
Wire rods ½-⅝" Pitts.	6.40	6.40	6.40	6.15	4.525

PIG IRON, Gross Ton	Feb. 18 1959	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bessemer, Pitts.	$67.00	$67.00	$67.00	$67.00	$57.00
Basic, Valley	66.00	66.00	66.00	66.00	56.00
Basic, deld., Phila.	70.41	70.41	70.41	70.41	59.66
No. 2 Fdry, NevilleIsland, Pa.	66.50	66.50	66.50	66.50	56.50
No. 2 Fdry, Chicago	66.50	66.50	66.50	66.50	56.50
No. 2 Fdry, deld., Phila.	70.91	70.91	70.91	70.91	60.16
No. 2 Fdry, Birm.	62.50	62.50	62.50	62.50	52.88
No. 2 Fdry (Birm.) deld. Cin.	70.20	70.20	70.20	70.20	60.43
Malleable, Valley	66.50	66.50	66.50	66.50	56.50
Malleable, Chicago	66.50	66.50	66.50	66.50	56.50
Ferromanganese, net ton†	245.00	245.00	245.00	245.00	200.00

†74-76% Mn, Duquesne, Pa.

SCRAP, Gross Ton (Including broker's commission)					
No. 1 Heavy Melt, Pittsburgh	$43.50	$43.50	$43.50	$34.50	$28.50
No. 1 Heavy Melt, E. Pa.	40.00	40.00	36.00	38.50	25.00
No. 1 Heavy Melt, Chicago	44.00	44.00	42.50	38.50	27.00
No. 1 Heavy Melt, Valley	48.50	48.50	43.50	37.50	25.50
No. 1 Heavy Melt, Cleve.	44.50	44.50	40.50	33.50	23.50
No. 1 Heavy Melt, Buffalo	41.50	41.50	35.50	28.50	25.00
Rails, Rerolling, Chicago	64.50	64.50	62.50	54.50	36.50
No. 1 Cast, Chicago	49.50	49.50	47.50	41.50	29.50

COKE, Net Ton					
Beehive, Furn., Connlsvl.	$15.25	$15.25	$15.25	$15.25	$14.75
Beehive, Fdry., Connlsvl.	18.25	18.25	18.25	18.25	16.75
Oven, Fdry., Milwaukee	30.50	30.50	30.50	30.50	25.25

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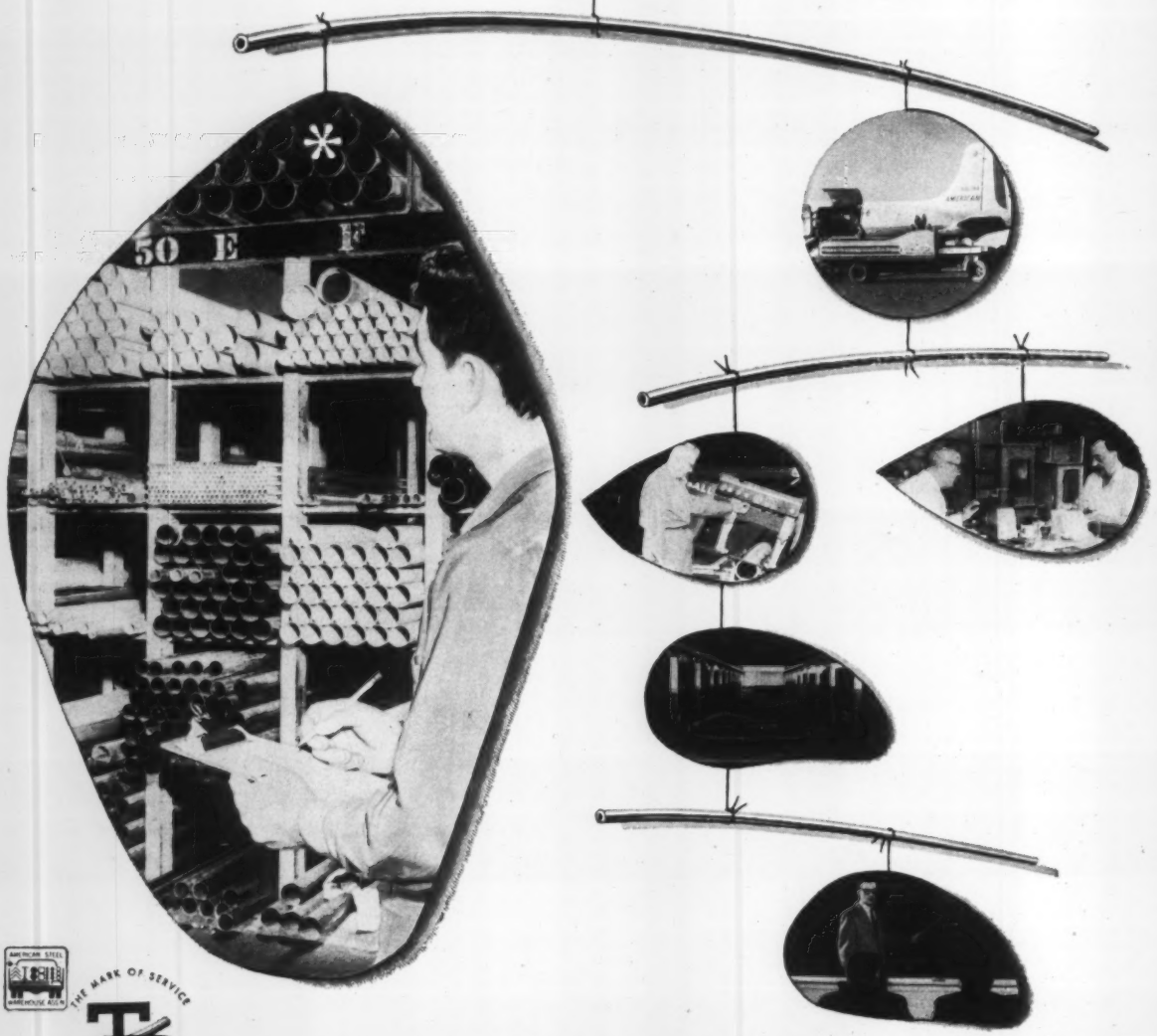

THE MARK OF SERVICE IN STEEL TUBING

TUBE DISTRIBUTORS CO., INC.

GARDEN CITY, NEW YORK • TWX: G-CY-NY-4695 • CABLE: TUBEDIS

Steel Prices

Mill prices as reported to STEEL, Feb. 18, cents per pound except as otherwise noted. *Changes shown in italics.* Code number following mill point indicates producing company. Key to producers, page 122, footnotes, page 124.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)
Munhall,Pa. U5 .....$76.00

INGOTS, Alloy (NT)
Detroit S41 .....$82.00
Economy,Pa. B14 .....82.00
Farrell,Pa. S3 .....82.00
Lowellville,O. S3 .....82.00
Midland,Pa. C18 .....82.00
Munhall,Pa. U5 .....82.00
Sharon,Pa. S3 .....82.00

BILLETS, BLOOMS & SLABS Carbon, Rerolling (NT)
Bartonville,Ill. K4 ....$82.00
Bessemer,Pa. U5 .....80.00
Buffalo R2 .....80.00
Clairton,Pa. U5 .....80.00
Ensley,Ala. T2 .....80.00
Fairfield,Ala. T2 .....80.00
Fontana,Calif. K1 .....90.50
Gary,Ind. U5 .....80.00
Johnstown,Pa. B2 .....80.00
Lackawanna,N.Y. B2 ..80.00
Munhall,Pa. U5 .....80.00
Owensboro,Ky. G8 .....80.00
S.Chicago,Ill. R2, U5 ..80.00
S.Duquesne,Pa. U5 .....80.00
Sterling,Ill. N15 .....80.00
Youngstown R2 .....80.00

Carbon, Forging (NT)
Bessemer,Pa. U5 ....$99.50
Buffalo R2 .....99.50
Canton,O. R2 .....102.00
Clairton,Pa. U5 .....99.50
Conshohocken,Pa. A3 ..104.50
Ensley,Ala. T2 .....99.50
Fairfield,Ala. T2 .....99.50
Farrell,Pa. S3 .....99.50
Fontana,Calif. K1 ....109.00
Gary,Ind. U5 .....99.50
Geneva,Utah C11 .....99.50
Houston S5 .....104.50
Johnstown,Pa. B2 .....99.50
Lackawanna,N.Y. B2 ..99.50
LosAngeles B3 .....109.00
Midland,Pa. C18 .....99.50
Munhall,Pa. U5 .....99.50
Owensboro,Ky. G8 .....99.50
Seattle B3 .....113.00
Sharon,Pa. S3 .....99.50
S.Chicago R2, U5, W14 .99.50
S.Duquesne,Pa. U5 ....99.50
S.SanFrancisco B3 ..109.00
Warren,O. C17 .....99.50

Alloy, Forging (NT)
Bethlehem,Pa. B2 ....$119.00
Bridgeport,Conn. C32..119.00
Buffalo R2 .....119.00
Canton,O. R2, T7 .....119.00
Conshohocken,Pa. A3..126.00
Detroit S41 .....119.00
Economy,Pa. B14 ....119.00
Farrell,Pa. S3 .....119.00
Fontana,Calif. K1 ....140.00
Gary,Ind. U5 .....119.00
Houston S5 .....124.00
Ind.Harbor,Ind. Y1 ..119.00
Johnstown,Pa. B2 ....119.00
Lackawanna,N.Y. B2..119.00
LosAngeles B3 .....139.00
Lowellville,O. S3 ....119.00
Massillon,O. R2 .....119.00
Midland,Pa. C18 .....119.00
Munhall,Pa. U5 .....119.00
Owensboro,Ky. G8 ....119.00
Sharon,Pa. S3 .....119.00
S.Chicago R2,U5,W14.119.00
S.Duquesne,Pa. U5 ..119.00
Struthers,O. Y1 .....119.00
Warren,O. C17 .....119.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 .....$122.50
Canton,O. R2 .....125.00
Cleveland R2 .....122.50
Gary,Ind. U5 .....122.50
S.Chicago,Ill. R2, W14 122.50
S.Duquesne,Pa. U5 ..122.50
Warren,O. C17 .....122.50

SKELP
Aliquippa,Pa. J5 .....5.05
Munhall,Pa. U5 .....5.05
Pittsburgh J5 .....5.05
Warren,O. R2 .....5.05
Youngstown R2, U5 ....5.05

WIRE RODS
AlabamaCity,Ala. R2 ..6.40
Aliquippa,Pa. J5 .....6.40
Alton,Ill. L1 .....6.60
Bartonville,Ill. K4 ....6.50
Buffalo W12 .....6.40
Cleveland A7 .....6.40
Donora,Pa. A7 .....6.40
Fairfield,Ala. T2 .....6.40
Houston S5 .....6.65
IndianaHarbor,Ind. Y1..6.40
Johnstown,Pa. B2 .....6.40
Joliet,Ill. A7 .....6.40
KansasCity,Mo. S5 ....6.65
Kokomo,Ind. C16 .....6.50
LosAngeles B3 .....7.20
Minnequa,Colo. C10 ....6.65
Monessen,Pa. P7 .....6.40
N.Tonawanda,N.Y. B11..6.40
Pittsburg,Calif. C11 ....7.20
Portsmouth,O. P12 ....6.40
Roebling,N.J. R5 .....6.50
S.Chicago,Ill. R2, W14..6.40
SparrowsPoint,Md. B2 ..6.50
Sterling,Ill.(1) N15 ....6.40
Sterling,Ill. N15 .....6.50
Struthers,O. Y1 .....6.40
Worcester,Mass. A7 ....6.70

STRUCTURALS

Carbon Steel Std. Shapes
AlabamaCity,Ala. R2 ..5.50
Aliquippa,Pa. J5 .....5.50
Atlanta A11 .....5.70
Bessemer,Ala. T2 .....5.55
Bethlehem,Pa. B2 .....5.55
Birmingham C15 .....5.50
Clairton,Pa. U5 .....5.50
Fairfield,Ala. T2 .....5.50
Fontana,Calif. K1 .....6.30
Gary,Ind. U5 .....5.50
Geneva,Utah C11 .....5.50
Houston S5 .....5.60
Ind.Harbor,Ind. I-2, Y1.5.50
Johnstown,Pa. B2 .....5.55
Joliet,Ill. P22 .....5.50
KansasCity,Mo. S5 ....5.60
Lackawanna,N.Y. B2 ..5.55
LosAngeles B3 .....6.20
Minnequa,Colo. C10 ....5.80
Munhall,Pa. U5 .....5.50
Niles,Calif. P1 .....6.25
Phoenixville,Pa. P4 ....5.55
Portland,Oreg. O4 .....6.25
Seattle B3 .....6.25
S.Chicago,Ill. U5, W14..5.50
S.SanFrancisco B3 ....6.15
Sterling,Ill. N15 .....5.50
Torrance,Calif. C11 ....6.20
Weirton,W.Va. W6 ....5.50

Wide Flange
Bethlehem,Pa. B2 .....5.55
Clairton,Pa. U5 .....5.50
Fontana,Calif. K1 .....6.45
IndianaHarbor,Ind. I-2..5.50
Lackawanna,N.Y. B2 ..5.55
Munhall,Pa. U5 .....5.50
Phoenixville,Pa. P4 ....5.55
S.Chicago,Ill. U5 .....5.50
S.SanFrancisco B3 ....6.15
Sterling,Ill. N15 .....5.50
Torrance,Calif. C11 ....6.20
Weirton,W.Va. W6 ....5.50

Alloy Std. Shapes
Aliquippa,Pa. J5 .....6.80
Clairton,Pa. U5 .....6.80
Gary,Ind. U5 .....6.80
Houston S5 .....6.90
Munhall,Pa. U5 .....6.80
S.Chicago,Ill. U5, W14..6.80

H.S., L.A., Std. Shapes
Aliquippa,Pa. J5 .....8.05
Bessemer,Ala. T2 .....8.05
Bethlehem,Pa. B2 .....8.10
Clairton,Pa. U5 .....8.05
Fairfield,Ala. T2 .....8.05
Fontana,Calif. K1 .....8.85
Gary,Ind. U5 .....8.05
Geneva,Utah C11 .....8.05
Houston S5 .....8.15
Ind.Harbor,Ind. I-2, Y1.8.05
Johnstown,Pa. B2 .....8.10
KansasCity,Mo. S5 ....8.15
Lackawanna,N.Y. B2 ..8.10
Los Angeles B3 .....8.75
Munhall,Pa. U5 .....8.05
Seattle B3 .....8.80
S.Chicago,Ill. U5, W14..8.05
S.SanFrancisco B3 ....8.70
Sterling,Ill. N15 .....7.75
Struthers,O. Y1 .....8.05

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 .....8.10
Ind.Harbor,Ind. I-2 ....8.05
Lackawanna,N.Y. B2 ..8.10
Munhall,Pa. U5 .....8.05
S.Chicago,Ill. U5 .....8.05
Sterling,Ill. N15 .....7.75

PILING

BEARING PILES
Bethlehem,Pa. B2 .....5.55
Ind.Harbor,Ind. I-2 ....5.50
Lackawanna,N.Y. B2 ..5.55
Munhall,Pa. U5 .....5.50
S.Chicago,Ill. I-2, U5 ..5.50

STEEL SHEET PILING
Ind.Harbor,Ind. I-2 ....6.50
Lackawanna,N.Y. B2 ..6.50
Munhall,Pa. U5 .....6.50
S.Chicago,Ill. I-2, U5 ..6.50
Weirton,W.Va. W6 ....6.50

PLATES

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ..5.30
Aliquippa,Pa. J5 .....5.30
Ashland,Ky.(15) A10 ...5.30
Atlanta A11 .....5.50
Bessemer,Ala. T2 .....5.30
Clairton,Pa. U5 .....5.30
Claymont,Del. C22 .....5.30
Cleveland J5, R2 .....5.30
Coatesville,Pa. L7 .....5.30
Conshohocken,Pa. A3 ..5.30
Ecorse,Mich. G5 .....5.30
Fairfield,Ala. T2 .....5.30
Farrell,Pa. S3 .....5.30
Fontana,Calif.(30) K1 ..6.10
Gary,Ind. U5 .....5.30
Geneva,Utah C11 .....5.30
GraniteCity,Ill. G4 ....5.40
Harrisburg,Pa. P4 ....5.30
Houston S5 .....5.40
Ind.Harbor,Ind. I-2, Y1.5.30
Johnstown,Pa. B2 .....5.30
Lackawanna,N.Y. B2 ..5.30
Mansfield,O. E6 .....5.30
Minnequa,Colo. C10 ....6.15
Munhall,Pa. U5 .....5.30
Newport,Ky. A2 .....5.30
Pittsburgh J5 .....5.30
Riverdale,Ill. A1 .....5.30
Seattle B3 .....6.20
Sharon,Pa. S3 .....5.30
S.Chicago,Ill. U5, W14..5.30
SparrowsPoint,Md. B2..5.30
Sterling,Ill. N15 .....5.30
Steubenville,O. W10 ....5.30
Warren,O. R2 .....5.30
Youngstown U5, Y1 ....5.30
Youngstown(27) R2 ....5.30

PLATES, Carbon Abras. Resist.
Claymont,Del. C22 .....7.05
Fontana,Calif. K1 .....7.85
Geneva,Utah C11 .....7.05
Houston S5 .....7.15
Johnstown,Pa. B2 .....7.05
SparrowsPoint,Md. B2 ..7.05

PLATES, Wrought Iron
Economy,Pa. B14 .....13.55

PLATES, H.S., L.A.
Aliquippa,Pa. J5 .....7.95
Ashland,Ky. A10 .....7.95
Bessemer,Ala. T2 .....7.95
Clairton,Pa. U5 .....7.95
Claymont,Del. C22 .....7.95
Cleveland J5, R2 .....7.95
Coatesville,Pa. L7 .....7.95
Conshohocken,Pa. A3 ..7.95
Economy,Pa. B14 .....7.95
Ecorse,Mich. G5 .....7.95
Fairfield,Ala. T2 .....7.95
Farrell,Pa. S3 .....7.95
Fontana,Calif.(30) K1 ..8.75
Gary,Ind. U5 .....7.95
Geneva,Utah C11 .....7.95
Houston S5 .....8.05
Ind.Harbor,Ind. I-2, Y1.7.95
Johnstown,Pa. B2 .....7.95
Munhall,Pa. U5 .....7.95
Pittsburgh J5 .....7.95
Seattle B3 .....8.85
Sharon,Pa. S3 .....7.95
S.Chicago,Ill. U5, W14..7.95
SparrowsPoint,Md. B2 ..7.95
Warren,O. R2 .....7.95
Youngstown U5, Y1 ....7.95

PLATES, Alloy
Aliquippa,Pa. J5 .....7.50
Claymont,Del. C22 ....7.50
Coatesville,Pa. L7 .....7.50
Economy,Pa. B14 .....7.50
Farrell,Pa. S3 .....7.50
Fontana,Calif. K1 .....8.30
Gary,Ind. U5 .....7.50
Houston S5 .....7.60
Ind.Harbor,Ind. Y1 ....7.50
Johnstown,Pa. B2 .....7.50
Lowellville,O. S3 .....7.50
Munhall,Pa. U5 .....7.50
Newport,Ky. A2 .....7.50
Pittsburgh J5 .....7.50
Seattle B3 .....8.40
Sharon,Pa. S3 .....7.50
S.Chicago,Ill. U5, W14..7.50
SparrowsPoint,Md. B2..7.50
Youngstown Y1 .....7.50

FLOOR PLATES
Cleveland J5 .....6.375
Conshohocken,Pa. A3 ..6.375
Ind.Harbor,Ind. I-2 ..6.375
Munhall,Pa. U5 .....6.375
Pittsburgh J5 .....6.375
S.Chicago,Ill. U5 ....6.375

PLATES, Ingot Iron
Ashland c.l.(15) A10 ..5.55
Ashland l.c.l.(15) A10 ..6.05
Cleveland c.l. R2 .....6.05
Warren,O. c.l. R2 ....6.05

BARS

BARS, Hot-Rolled Carbon (Merchant Quality)
Ala.City,Ala.(9) R2 ...5.675
Aliquippa,Pa. (9) J5 ..5.675
Alton,Ill. L1 .....5.875
Atlanta(9) A11 .....5.875
Bessemer,Ala.(9) T2 ..5.675
Birmingham(9) C15 ..5.675
Buffalo(9) R2 .....5.675
Canton,O.(23) R2 .....6.15
Clairton,Pa.(9) U5 ....5.675
Cleveland(9) R2 .....5.675
Ecorse,Mich(9) G5 .....5.675
Emeryville,Calif. J7 ..6.425
Fairfield,Ala.(9) T2 ..5.675
Fairless,Pa.(9) U5 ....5.825
Fontana,Calif.(9) K1 ..6.375
Gary,Ind.(9) U5 .....5.675
Houston(9) S5 .....5.925
Ind.Harbor(9) I-2, Y1..5.675
Johnstown,Pa.(9) B2 ..5.675
Joliet,Ill. P22 .....5.675
KansasCity,Mo.(9) S5..5.925
Lackawanna(9) B2 ....5.675
LosAngeles(9) B3 .....6.375
Massillon,O.(23) R2 ....6.15
Midland,Pa.(23) C18 ...6.025
Milton,Pa. M18 .....5.825
Minnequa,Colo. C10 ....6.125
Niles,Calif. P1 .....6.375
N.T'wan'a,N.Y.(23)B11 6.025
Owensboro,Ky.(9) G8 ..6.025
Pittsburg,Calif.(9) C11..6.375
Pittsburgh(9) J5 .....5.675
Portland,Oreg. O4 .....6.425
Riverdale,Ill.(9) A1 ..5.675
Seattle B3, N14 .....6.425
S.Ch'c'go(9)R2,U5,W14 5.675
S.Duquesne,Pa.(9) U5 ..5.675
S.SanFran.,Calif.(9) B3 6.425
Sterling,Ill.(1)(9) N15..5.675
Sterling,Ill.(9) N15 ...5.775
Struthers,O.(9) Y1 ....5.675
Tonawanda,N.Y. B12 ..5.675
Torrance,Calif.(9) C11..6.375
Warren,O. C17 .....6.075
Youngstown(9) R2, U5..5.675

BARS, Hot-Rolled Alloy
Aliquippa,Pa. J5 .....6.725
Bethlehem,Pa. B2 .....6.725
Bridgeport,Conn. C32 ..6.80
Buffalo R2 .....6.725
Canton,O. R2, T7 .....6.725
Clairton,Pa. U5 .....6.725
Detroit S41 .....6.725
Economy,Pa. B14 .....6.725
Ecorse,Mich. G5 .....6.725
Fairless,Pa. U5 .....6.875
Farrell,Pa. S3 .....6.725
Fontana,Calif. K1 .....7.775
Gary,Ind. U5 .....6.725
Houston S5 .....6.975
Ind.Harbor,Ind. I-2, Y1.6.725
Johnstown,Pa. B2 .....6.775
KansasCity,Mo. S5 ....6.975
Lackawanna,N.Y. B2..6.725
LosAngeles B3 .....7.775
Lowellville,O. S3 .....6.725
Massillon,O. R2 .....6.725
Midland,Pa. C18 .....6.725
Owensboro,Ky. G8 .....6.725
Pittsburgh J5 .....6.725
Sharon,Pa. S3 .....6.725
S.Chicago R2, U5, W14 6.725
S.Duquesne,Pa. U5 ....6.725
Struthers,O. Y1 .....6.725
Warren,O. C17 .....6.725
Youngstown U5 .....6.725

BARS & SMALL SHAPES, H.R. High-Strength, Low-Alloy
Aliquippa,Pa. J5 .....8.30
Bessemer,Ala. T2 .....8.30
Bethlehem,Pa. B2 .....8.30
Clairton,Pa. U5 .....8.30
Cleveland R2 .....8.30
Ecorse,Mich. G5 .....8.30
Fairfield,Ala. T2 .....8.30
Fontana,Calif. K1 .....9.00
Gary,Ind. U5 .....8.30
Houston S5 .....8.55
Ind.Harbor,Ind. Y1 ....8.30
Johnstown,Pa. B2 .....8.30
KansasCity,Mo. S5 ....8.55
Lackawanna,N.Y. B2 ..8.30
LosAngeles B3 .....9.00
Pittsburgh J5 .....8.30
Seattle B3 .....9.05
S.Chicago,Ill. R2, W14..8.30
S.Duquesne,Pa. U5 ....8.30
S.SanFrancisco B3 ....9.05
Struthers,O. Y1 .....8.30
Youngstown U5 .....8.30

BAR SIZE ANGLES; H.R. Carbon
Bethlehem,Pa.(9) B2 ..5.825
Houston(9) S5 .....5.925
KansasCity,Mo.(9) S5..5.925
Lackawanna(9) B2 ....5.675
Sterling,Ill. N15 .....5.775
Sterling,Ill.(1) N15 ..5.675
Tonawanda,N.Y. B12 ..5.675

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 .....5.675
Atlanta A11 .....5.875
Joliet,Ill. P22 .....5.675
Minnequa,Colo. C10 ....6.125
Niles,Calif. P1 .....6.375
Pittsburgh J5 .....5.675
Portland,Oreg. O4 .....6.425
SanFrancisco S7 .....6.52
Seattle B3 .....6.425

BAR SHAPES, Hot-Rolled Alloy
Aliquippa,Pa. J5 .....6.80
Clairton,Pa. U5 .....6.80
Gary,Ind. U5 .....6.80
Houston S5 .....7.05
KansasCity,Mo. S5 ....7.05
Pittsburgh J5 .....6.80
Youngstown U5 .....6.80

BARS, C.F. Loaded (Including loaded extra)

Carbon
LosAngeles P2, S30 ..11.75*

Alloy
Ambridge,Pa. W18 ..10.175
BeaverFalls,Pa. M12 ..10.175
Camden,N.J. P13 ....10.35
Chicago W18 .....10.175
Elyria,O. W8 .....10.175
Monaca,Pa. S17 .....10.175
Newark,N.J. W18 ....10.35
SpringCity,Pa. K3 ....10.35

*Grade A; add 0.05c for Grade B.

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ....7.65
BeaverFalls,Pa. M12,R2.7.65
Birmingham C15 .....8.25
Buffalo B5 .....7.70
Camden,N.J. P13 .....8.10
Carnegie,Pa. C12 .....7.65
Chicago W18 .....7.65
Cleveland A7, C20 ....7.65
Detroit B5, P17 .....7.85
Detroit S41 .....7.65
Donora,Pa. A7 .....7.65
Elyria,O. W8 .....7.65
FranklinPark,Ill. N5 ....7.65
Gary,Ind. R2 .....7.65
GreenBay,Wis. F7 .....7.65
Hammond,Ind. J5, L2 ..7.65
Hartford,Conn. R2 .....8.15
Harvey,Ill. B5 .....7.65
LosAngeles(49) S30 ....9.10
LosAngeles(49) P2, R2.9.10
Mansfield,Mass. B2 ....8.20
Massillon,O. R2, R8 ....7.65
Midland,Pa. C18 .....7.65
Monaca,Pa. S17 .....7.65
Newark,N.J. W18 .....8.10
NewCastle,Pa.(17) B4 ..7.65
Pittsburgh J5 .....7.65
Plymouth,Mich. P5 ....7.90
Putnam,Conn. W18 ....8.20
Readville,Mass. C14 ....8.20
S.Chicago,Ill. W14 ....7.65
SpringCity,Pa. K3 .....8.10
Struthers,O. Y1 .....7.65
Warren,O. C17 .....7.65
Waukegan,Ill. A7 .....7.65
Willimantic,Conn. J5 ....8.15
Youngstown F3, Y1 ....7.65

BARS, Cold-Finished Carbon (Turned and Ground)
Cumberland,Md. (5) C19..6.55

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 ....9.025
BeaverFalls,Pa. M12,R2 9.025
Bethlehem,Pa. B2 .....9.025
Bridgeport,Conn. C32 ..9.175
Buffalo B5 .....9.025
Camden,N.J. P13 .....9.20
Canton,O. T7 .....9.025
Carnegie,Pa. C12 .....9.025
Chicago W18 .....9.025
Cleveland A7, C20 ....9.025
Detroit B5, P17 .....9.225
Detroit S41 .....9.025
Donora,Pa. A7 .....9.025
Elyria,O. W8 .....9.025
FranklinPark,Ill. N5 ..9.025
Gary,Ind. R2 .....9.025
GreenBay,Wis. F7 .....9.025
Hammond,Ind. J5, L2..9.025
Hartford,Conn. R2 ....9.325
Harvey,Ill. B5 .....9.025
Lackawanna,N.Y. B2 ..9.025
LosAngeles P2, S30 ...11.00
Mansfield,Mass. B5 ...9.325
Massillon,O. R2, R8 ...9.025
Midland,Pa. C18 .....9.025
Monaca,Pa. S17 .....9.025
Newark,N.J. W18 .....9.20
Plymouth,Mich. P5 ....9.225
S.Chicago,Ill. W14 ....9.025
SpringCity,Pa. K3 .....9.20
Struthers,O. Y1 .....9.025
Warren,O. C17 .....9.025
Waukegan,Ill. A7 .....9.025
Willimantic,Conn. J5 ..9.325
Worcester,Mass. A7 ...9.325
Youngstown F3, Y1 ...9.025

BARS, Reinforcing, Billet (To Fabricators)

AlabamaCity,Ala. R2 ..5.675
Atlanta A11 .....5.675
Birmingham C15 .....5.675
Buffalo R2 .....5.675
Cleveland R2 .....5.675
Ecorse,Mich. G5 .....5.675
Emeryville,Calif. J7 ..6.425
Fairfield Ala. T2 .....5.675
Fairless,Pa. U5 .....5.825
Fontana,Calif. K1 ....6.375
Ft.Worth,Tex(4)(26)T4 5.925
Gary,Ind. U5 .....5.675
Houston S5 .....5.925
Ind.Harbor Ind. I-2, Y1 5.675
Johnstown Pa. B2 ....5.675
Joliet,Ill. P22 .....5.675
KansasCity,Mo. S5 ...5.925
Kokomo,Ind. C16 .....5.775
Lackawanna,N.Y. B2 ..5.675
LosAngeles B3 .....6.375
Madison,Ill. L1 .....5.875
Milton,Pa. M18 .....5.825
Minnequa,Colo. C10 ...6.125
Niles,Calif. P1 .....6.375
Pittsburg,Calif. C11 ..6.375
Pittsburgh J5 .....5.675
Portland,Oreg. O4 ....6.425
SandSprings,Okla. S5 ..5.925
Seattle B3, N14 .....6.425
S.Chicago,Ill. R2, W14 .5.675
S.Duquesne,Pa. U5 ...5.675
S.SanFrancisco B3 ....6.425
SparrowsPoint,Md. B2 .5.675
Sterling,Ill.(1) N15 ...5.675
Sterling,Ill. N15 .....5.775
Struthers,O. Y1 .....5.675
Tonawanda,N.Y. B12 ...6.10
Torrance,Calif. C11 ...6.375
Youngstown R2, U5 ..5.675

BARS, Reinforcing, Billet (Fabricated: to Consumers)

Baltimore B2 .....7.42
Boston B2, U8 .....8.15
Chicago U8 .....7.41
Cleveland U8 .....7.39
Houston S5 .....7.60
Johnstown,Pa. B2 .....7.33
KansasCity,Mo. S5 ....7.60
Lackawanna,N.Y. B2 ..7.35
Marion,O. P11 .....6.70
Newark N.J. U8 .....7.80
Philadelphia U8 .....7.63
Pittsburgh J5, U8 .....7.35
SandSprings,Okla. S5 ..7.60
Seattle B3, N14 .....7.95
SparrowsPt.,Md. B2 ...7.33
St.Paul U8 .....8.17
Williamsport,Pa. S19 ..7.25

BARS, Wrought Iron

Economy,Pa.(S.R.)B14 14.90
Economy,Pa.(D.R.)B14 18.55
Economy(Staybolt)B14 19.00
McK.Rks.(S.R.) L5 ...14.50
McK.Rks.(D.R.) L5 ..19.80
McK.Rks.(Staybolt) L5 20.95

BARS, Rail Steel

ChicagoHts.(3) C2, I-2 5.575
ChicagoHts.(4) (44) I-2 5.675
ChicagoHts.(4) C2 ....5.675
Franklin Pa.(3) F5 ...5.575
Franklin,Pa.(4) F5 ...5.675
JerseyShore,Pa.(3) J8 ..5.55
Marion,O.(3) P11 ....5.575
Tonawanda(3) B12 ....5.575
Tonawanda(4) B12 ....6.10

SHEETS

SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

Lackawanna,N.Y. B2 ..5.10
Allenport,Pa. P7 .....5.10
Aliquippa Pa. J5 .....5.10
Ashland,Ky.(8) A10 ...5.10
Cleveland J5, R2 .....5.10
Conshohocken,Pa. A3 ..5.15
Detroit(8) M1 .....5.10
Ecorse,Mich. G5 .....5.10
Fairfield,Ala. T2 .....5.10
Fairless,Pa. U5 .....5.15
Farrell,Pa. S3 .....5.10
Fontana,Calif. K1 ....5.825
Gary,Ind. U5 .....5.10
Geneva,Utah C11 .....5.20
GraniteCity,Ill.(8) G4 ..5.20
Ind.Harbor,Ind. I-2, Y1.5.10
Irvin,Pa. U5 .....5.10
Lackawanna,N.Y. B2 ..5.10
Mansfield,O. E6 .....5.10
Munhall,Pa. U5 .....5.10
Newport,Ky. A2 .....5.10
Niles,O. M21, S3 .....5.10
Pittsburg,Calif. C11 ...5.80
Pittsburgh J5 .....5.10
Portsmouth,O. P12 ....5.10
Riverdale,Ill. A1 .....5.10
Sharon,Pa. S3 .....5.10
S.Chicago,Ill. U5, W14..5.10
SparrowsPoint,Md. B2 ..5.10
Steubenville,O. W10 ....5.10
Warren,O. R2 .....5.10
Weirton,W.Va. W6 ....5.10
Youngstown U5, Y1 ....5.10

SHEETS, H.R. (19 Ga. & Lighter)

Niles,O. M21, S3 .....6.275

SHEETS, H.R. Alloy

Gary,Ind. U5 .....8.40
Ind.Harbor,Ind. Y1 ....8.40
Irvin,Pa. U5 .....8.40
Munhall,Pa. U5 .....8.40
Newport,Ky. A2 .....8.40
Youngstown U5, Y1 ....8.40

SHEETS, H.R. (14 Ga. & Heavier) High-Strength, Low-Alloy

Aliquippa,Pa. J5 .....7.525
Ashland,Ky. A10 .....7.525
Cleveland J5, R2 .....7.525
Conshohocken,Pa. A3 ..7.575
Ecorse,Mich. G5 .....7.525
Fairfield Ala. T2 .....7.525
Fairless,Pa. U5 .....7.575
Farrell,Pa. S3 .....7.525
Fontana,Calif. K1 .....8.25
Gary,Ind. U5 .....7.525
Ind.Harbor,Ind. I-2, Y1 7.525
Irvin,Pa. U5 .....7.525
Lackawanna(35) B2 ..7.525
Munhall,Pa. U5 .....7.525
Niles O. S3 .....7.525
Pittsburgh J5 .....7.525
S.Chicago,Ill. U5, W14.7.525
Sharon,Pa. S3 .....7.525
SparrowsPoint(36) B2..7.525
Warren,O. R2 .....7.525
Weirton,W.Va. W6 ....7.525
Youngstown U5, Y1 ...7.525

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10 ...5.35
Cleveland R2 .....5.875
Warren,O. R2 .....5.875

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....7.05
Middletown,O. A10 ....6.775
Warren,O. R2 .....7.05

SHEETS, Cold-Rolled Steel (Commercial Quality)

AlabamaCity,Ala. R2 ..6.275
Allenport,Pa. P7 .....6.275
Aliquippa,Pa. J5 .....6.275
Cleveland J5, R2 .....6.275
Conshohocken,Pa. A3 ..6.325
Detroit M1 .....6.275
Ecorse,Mich. G5 .....6.275
Fairfield,Ala. T2 .....6.275
Fairless,Pa. U5 .....6.325
Follansbee,W.Va. F4 ..6.275
Fontana,Calif. K1 .....7.40
Gary,Ind. U5 .....6.275
GraniteCity,Ill. G4 ....6.375
Ind.Harbor,Ind. I-2, Y1 6.275
Irvin,Pa. U5 .....6.275
Lackawanna,N.Y. B2 ..6.275
Mansfield,O. E6 .....6.275
Middletown,O. A10 ....6.275
Newport,Ky. A2 .....6.275
Pittsburg,Calif. C11 ...7.225
Pittsburgh J5 .....6.275
Portsmouth,O. P12 ....6.275
SparrowsPoint,Md. B2..6.275
Steubenville,O. W10 ...6.275
Warren,O. R2 .....6.275
Weirton,W.Va. W6 ....6.275
Yorkville,O. W10 .....6.275
Youngstown Y1 .....6.275

SHEETS, Cold-Rolled, High-Strength, Low-Alloy

Aliquippa,Pa. J5 .....9.275
Cleveland J5, R2 .....9.275
Ecorse,Mich. G5 .....9.275
Fairless,Pa. U5 .....9.325
Fontana,Calif. K1 ....10.40
Gary,Ind. U5 .....9.275
Ind.Harbor,Ind. I-2, Y1 9.275
Lackawanna(37) B2 ..9.275
Pittsburgh J5 .....9.275
SparrowsPoint(38) B2..9.275
Warren O. R2 .....9.275
Weirton,W.Va. W6 ....9.275
Youngstown Y1 .....9.275

SHEETS, Culvert

	Cu Steel	Cu Fe
Ala.City,Ala. R2	7.225	....
Ashland,Ky. A10	7.225	7.475
Canton,O. R2	7.225	7.75
Fairfield T2	7.225	7.475
Gary,Ind. U5	7.225	7.475
GraniteCity,Ill.G4	7.325	....
Ind.Harbor I-2	7.225	7.475
Irvin,Pa. U5	7.225	7.475
Kokomo Ind. C16	7.325	....
MartinsFry. W10	7.225	7.475
Pitts.,Calif. C11	7.975	....
SparrowsPt. B2	7.225	....
Pittsburgh J5	7.225	....

SHEETS, Culvert—Pure Iron

Ind.Harbor,Ind. I-2 ...7.475

SHEETS, Galvanized Steel Hot-Dipped

AlabamaCity,Ala. R2 .6.875‡
Ashland,Ky. A10 ....6.875†
Canton,O. R2 .....6.875‡
Dover,O. E6 .....6.875†
Fairfield,Ala. T2 ....6.875†
Gary,Ind. U5 .....6.875†
GraniteCity,Ill. G4 ...6.975*
Ind.Harbor,Ind. I-2 ..6.875†
Irvin,Pa. U5 .....6.875†
Kokomo,Ind. C16 ....6.975‡
MartinsFerry,O. W10 .6.875*
Middletown,O. A10 ...6.875†
Pittsburg Calif. C11 ..7.625*
Pittsburgh J5 .....6.875†
SparrowsPt.,Md. B2 ..6.875†
Warren,O. R2 .....6.875†
Weirton,W.Va. W6 ...6.875*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Well Casing

Fontana,Calif. K1 ....7.325

SHEETS, Galvanized High-Strength, Low-Alloy

Irvin,Pa. U5 .....10.125
Pittsburgh J5 .....10.125
SparrowsPt.(39) B2 ..10.025

SHEETS, Galvannealed Steel

Canton,O. R2 .....7.275
Irvin,Pa. U5 .....7.275

SHEETS, Galvanized Ingot Iron (Hot-Dipped Continuous)

Ashland,Ky. A10 .....7.125
Middletown,O. A10 ....7.125

SHEETS, Electrogalvanized

Cleveland(28) R2 .....7.65
Niles,O.(28) R2 .....7.65
Weirton,W.Va. W6 ....7.50
Youngstown J5 .....7.50

SHEETS, Aluminum Coated

Butler,Pa. A10 (type 1) 9.525
Butler,Pa. A10 (type 2) 9.625

SHEETS, Enameling Iron

Ashland,Ky. A10 .....6.775
Cleveland R2 .....6.775
Fairfield,Ala. T2 .....6.775
Gary,Ind. U5 .....6.775
GraniteCity,Ill. G4 ....6.875
Ind.Harbor,Ind. I-2, Y1 6.775
Irvin,Pa. U5 .....6.775
Middletown,O. A10 ....6.775
Niles,O. M21, S3 .....6.775
Youngstown Y1 .....6.775

BLUED STOCK, 29 Gage

Dover,O. E6 .....8.70
Follansbee,W.Va. F4 ...8.70
Ind.Harbor,Ind. I-2 ....8.70
Mansfield,O. E6 .....8.70
Warren O. R2 .....8.70
Yorkville,O. W10 .....8.70

SHEETS, Long Terne, Steel (Commercial Quality)

BeechBottom,W.Va.W10 7.225
Gary,Ind. U5 .....7.225
Mansfield,O. E6 .....7.225
Middletown,O. A10 ....7.225
Niles,O. M21, S3 .....7.225
Warren,O. R2 .....7.225
Weirton,W.Va. W6 ....7.225

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 ....7.625

Key To Producers

A1 Acme Steel Co.
A2 Acme-Newport Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Div., H. K. Porter Co., Inc.
A6 American Shim Steel Co.
A7 American Steel & Wire Div., U. S. Steel Corp.
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div., H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Plant, Wickwire Spencer Steel Div., Colo. Fuel & Iron
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.
C32 Carpenter Steel of N.Eng.

D2 Detroit Steel Corp.
D4 Disston Div., H. K. Porter Co. Inc.
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E5 Elliott Bros. Steel Co.
E6 Empire-Reeves Steel Corp.
E10 Enamel Prod. & Plating

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
G8 Green River Steel Corp.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins Steel Tube Works
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L6 Lone Star Steel Co.
L7 Lukens Steel Co.
L8 Leschen Wire Rope Div., H. K. Porter Co. Inc.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M14 McInnes Steel Co.
M16 Md. Fine & Special. Wire
M17 Metal Forming Corp.
M18 Milton Steel Div., Merritt-Chapman&Scott
M21 Mallory-Sharon Metals Corp.
M22 Mill Strip Products Co.

N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div., U. S. Steel Corp.
N5 Nelsen Steel & Wire Co.
N6 New England High Carbon Wire Co.
N8 Newman-Crosby Steel
N14 Northwest. Steel Rolling Mills Inc.
N15 Northwestern S.&W. Co.
N20 Neville Ferro Alloy Co.

O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Steel Corp., Sub. of Barium Steel Corp.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Div., Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., American Chain & Cable
P17 Plymouth Steel Corp.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.
P24 Phil. Steel & Wire Corp.

R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R8 Reliance Div., Eaton Mfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Div., Copperweld Steel Co.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Prod.
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
S40 Seneca Steel Service
S41 Stainless & Strip Div., J&L Steel Corp.
S42 Southern Elec. Steel Co.
T2 Tenn. Coal & Iron Div., U. S. Steel Corp.
T3 Tenn. Products & Chemical Corp.
T4 Texas Steel Co.
T5 Thomas Strip Div., Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
T13 Tube Methods Inc.
T19 Techalloy Co. Inc.

U3 Union Wire Rope Corp.
U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U. S. Steel Supply Div., U. S. Steel Corp.
U11 Union Carbide Metals Co.
U13 Union Steel Corp.

V2 Vanadium-Alloys Steel
V3 Vulcan-Kidd Steel Div., H. K. Porter Co.

W1 Wallace Barnes Steel Div., Associated Spring Corp.
W2 Wallingford Steel Corp.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W8 Western Automatic Machine Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.

Y1 Youngstown Sheet & Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	5.10
Allenport,Pa. P7	5.10
Alton,Ill. L1	5.30
Ashland,Ky.(8) A10	5.10
Atlanta A11	5.10
Bessemer,Ala. T2	5.10
Birmingham C15	5.10
Buffalo(27) R2	5.10
Conshohocken,Pa. A3	5.15
Detroit M1	5.10
Ecorse,Mich. G5	5.10
Fairfield,Ala. T2	5.10
Farrell,Pa. S3	5.10
Fontana,Calif. K1	5.825
Gary,Ind. U5	5.10
Ind.Harbor,Ind. I-2, Y1	5.10
Johnstown,Pa.(25) B2	5.10
Lackaw'na,N.Y.(25) B2	5.10
LosAngeles(25) B3	5.85
LosAngeles C1	8.60
Minnequa,Colo. C10	6.20
Riverdale,Ill. A1	5.10
SanFrancisco S7	6.60
Seattle (25) B3	6.10
Seattle N14	6.60
Sharon,Pa. S3	5.10
S.Chicago W14	5.10
S.SanFrancisco(25) B3	5.85
SparrowsPoint Md. B2	5.10
Torrance,Calif. C11	5.85
Warren,O. R2	5.10
Weirton,W.Va. W6	5.10
Youngstown U5	5.10

STRIP, Hot-Rolled Alloy

Carnegie,Pa. S18	8.40
Farrell,Pa. S3	8.40
Gary,Ind. U5	8.40
Houston S5	8.65
Ind.Harbor,Ind. Y1	8.40
KansasCity,Mo. S5	8.65
LosAngeles B3	9.60
Lowellville,O. S3	8.40
Newport,Ky. A2	8.40
Sharon,Pa. A2, S3	8.40
S.Chicago,Ill. W14	8.40
Youngstown U5, Y1	8.40

STRIP, Hot-Rolled High-Strength, Low-Alloy

Ashland,Ky A10	7.575
Bessemer,Ala. T2	7.575
Conshohocken,Pa. A3	7.575
Ecorse,Mich. G5	7.575
Fairfield,Ala. T2	7.575
Farrell,Pa. S3	7.575
Gary,Ind. U5	7.575
Ind.Harbor,Ind. I-2,Y1	7.575
Lackawanna,N.Y. B2	7.575
LosAngeles(25) B3	8.325
Seattle(25) B3	8.575
Sharon,Pa. S3	7.575
S.Chicago,Ill. W14	7.575
S.SanFrancisco(25) B3	8.325
SparrowsPoint,Md. B2	7.575
Warren,O. R2	7.575
Weirton,W.Va. W6	7.575
Youngstown U5, Y1	7.575

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	5.35
Warren,O. R2	5.875

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6	7.425
Baltimore T6	7.425
Boston T6	7.975
Buffalo S40	7.425
Cleveland A7, J5	7.425
Dearborn,Mich. S3	7.425
Detroit D2, M1, P20	7.425
Dover,O. G6	7.425
Evanston,Ill. M22	7.525
Farrell,Pa. S3	7.425
Follansbee,W.Va. F4	7.425
Fontana,Calif. K1	9.20
FranklinPark,Ill. T6	7.525
Ind.Harbor,Ind. Y1	7.425
Indianapolis S41	7.575
LosAngeles C1, S41	9.30
McKeesport,Pa. E10	7.525
NewBedford,Mass. R10	7.875
NewBritain,Conn. S15	7.875
NewCastle,Pa. B4, E5	7.425
NewHaven Conn. D2	7.875
NewKensington,Pa. A6	7.425
Pawtucket,R.I. R3	7.975
Pawtucket,R.I. N8	7.975
Philadelphia P24	7.875
Pittsburgh J5	7.425
Riverdale,Ill. A1	7.525
Rome,N.Y.(32) R6	7.425
Sharon,Pa. S3	7.425
Trenton N.J.(31) R5	8.875
Wallingford,Conn. W2	7.875
Warren,O. R2, T5	7.425
Worcester,Mass. A7	7.975
Youngstown S41, Y1	7.425

STRIP, Cold-Rolled Alloy

Boston T6	15.90
Carnegie,Pa. S18	15.55
Cleveland A7	15.55
Dover,O. G6	15.55
Farrell,Pa. S3	15.55
FranklinPark,Ill. T6	15.55
Harrison,N.J. C18	15.55
Indianapolis S41	15.70
LosAngeles S41	17.75
Lowellville,O. S3	15.55
Pawtucket,R.I. N8	15.90
Riverdale,Ill. A1	15.55
Sharon,Pa. S3	15.55
Worcester,Mass.A7	15.85
Youngstown S41	15.55

STRIP, Cold-Rolled High-Strength, Low-Alloy

Cleveland A7	10.80
Dearborn,Mich. S3	10.80
Dover,O. G6	10.80
Farrell,Pa. S3	10.80
Ind.Harbor,Ind. Y1	10.80
Sharon,Pa. S3	10.80
Warren,O. R2	10.80

STRIP, Cold-Finished Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	9.50	10.70	12.90	15.90	18.85
Boston T6	9.50	10.70	12.90	15.90	18.85
Bristol,Conn. W1	...	10.70	12.90	16.10	19.30
Carnegie, Pa. S18	8.95	10.40	12.60	15.60	....
Cleveland A7	8.95	10.40	12.60	15.60	18.55
Dearborn,Mich. S3	9.05	10.50	12.70	....	....
Detroit D2	9.05	10.50	12.70	15.70	....
Dover,O. G6	8.95	10.40	12.60	15.60	18.55
Evanston,Ill. M22	8.95	10.40	12.60	15.60	....
Farrell,Pa. S3	8.95	10.40	12.60	15.60	18.55
Fostoria,O. S1	10.05	10.40	12.60	15.60	....
FranklinPark,Ill. T6	9.05	10.40	12.60	15.60	18.55
Harrison,N.J. C18	....	....	12.90	16.10	19.30
Indianapolis S41	9.10	10.55	12.60	15.60	18.55
LosAngeles C1	11.15	12.60	14.80	17.80	....
LosAngeles S41	11.15	12.60	14.80	....	....
NewBritain,Conn. S15	9.40	10.70	12.90	15.90	18.85
NewCastle,Pa. B4, E5	8.95	10.40	12.60	15.60	....
NewHaven,Conn. D2	9.40	10.70	12.90	15.90	....
NewKensington,Pa. A6	9.85	10.40	12.60	15.60	....
New York W3	....	10.70	12.90	16.10	19.30
Pawtucket,R.I. N8	9.50	10.70	12.90	15.90	18.85
Riverdale,Ill. A1	9.05	10.40	12.60	15.60	18.55
Rome,N.Y.(32) R6	8.95	10.40	12.60	15.60	18.55
Sharon,Pa. S3	8.95	10.40	12.60	15.60	18.55
Trenton,N.J. R5	....	10.70	12.90	15.90	18.85
Wallingford,Conn. W2	9.40	10.70	12.90	15.90	18.75
Warren,O. T5	8.95	10.40	12.60	15.60	18.55
Worcester,Mass. A7, T6	9.50	10.70	12.90	15.90	18.85
Youngstown S41	8.95	10.40	12.60	15.60	18.55

Spring Steel (Tempered)	Up to 0.80C	0.81-1.05C	1.06-1.35C
Bristol,Conn. W1	...	18.85	22.95	27.80
Buffalo W12	...	18.85	....	....
Fostoria,O. S1	...	19.05	22.15	....
FranklinPark,Ill. T6	...	19.20	23.30	28.15
Harrison,N.J. C18	...	18.85	22.95	27.80
New York W3	...	18.85	22.95	27.80
Palmer,Mass. W12	...	18.85	....	....
Trenton,N.J. R5	...	18.85	22.95	27.80
Worcester,Mass. A7, T6	...	18.85	22.95	27.80
Youngstown S41	...	19.20	23.30	28.15

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$9.10	$9.35	$9.75
Fairfield,Ala. T2	9.20	9.45	9.85
Fairless,Pa. U5	9.20	9.45	9.85
Fontana,Calif. K1	9.75	10.00	10.40
Gary,Ind. U5	9.10	9.35	9.75
GraniteCity,Ill. G4	9.20	9.45	9.60
IndianaHarbor,Ind. I-2, Y1	9.10	9.35	9.75
Irvin,Pa. U5	9.10	9.35	9.75
Niles,O. R2	9.10	9.35	9.75
Pittsburg,Calif. C11	9.75	10.00	10.40
SparrowsPoint,Md. B2	9.10	9.35	9.75
Weirton,W.Va. W6	9.10	9.35	9.75
Yorkville,O. W10	9.10	9.35	9.75

ELECTROLYTIC TIN-COATED SHEET (Dollars per 100 lb)		
Aliquippa,Pa. J5 (21-27 Ga.)	7.90	8.10
Niles,O. R2 (20-27 Ga.)	7.90	8.10

TIN PLATE, American	1.25 lb	1.50 lb
Aliquippa,Pa.J5	$10.40	$10.65
Fairfield,Ala. T2	10.50	10.75
Fairless,Pa. U5..	10.50	10.75
Fontana,Calif.K1	11.05	11.30
Gary,Ind. U5 ...	10.40	10.65
Ind.Harb. Y1...	10.40	10.65
Pitts.,Calif C11.	11.05	11.30
Sp.Pt.,Md. B2 ..	10.40	10.65
Weirton,W.Va.W6	10.40	10.65
Yorkville,O. W10	10.40	10.65

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$8.20
Fairfield,Ala. T2	8.30
Fairless Pa. U5	8.30
Fontana,Calif. K1	8.85
Gary,Ind. U5	8.20
GraniteCity,Ill. G4	8.30
Ind.Harbor,Ind. I-2, Y1	8.20
Irvin.Pa. U5	8.20
Niles,O. R2	8.20
Pittsburg,Calif. C11	8.85
SparrowsPoint,Md. B2	8.25
Weirton W.Va. W6	8.20
Yorkville,O. W10	8.20

HOLLOWARE ENAMELING Black Plate (29 Gage)

Aliquippa,Pa. J5	7.85
Gary,Ind. U5	7.85
GraniteCity,Ill. G4	7.95
Ind.Harbor Ind. Y1	7.85
Irvin,Pa. U5	7.85
Yorkville,O. W10	7.85

MANUFACTURING TERNES (Special Coated, Base Box)

Gary,Ind. U5	$10.05
Irvin,Pa. U5	10.05

SILICON STEEL

C.R. COILS & CUT LENGTHS (22 Ga.) Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	....	11.70	12.40	13.55	14.65
Brackenridge,Pa. A4	....	....	12.40	13.55	14.65
GraniteCity,Ill. G4	9.975*	11.30*	12.00*	13.15*	....
IndianaHarbor,Ind. I-2	9.875*	11.20*	11.90*	13.05*	....
Mansfield,O. E6	9.875*	11.70	12.40	13.55	14.65
Newport,Ky. A2	9.875	11.70*	12.40*	13.55*	14.65*
Niles,O. M21	9.875*	11.70	12.40	13.55	....
Vandergrift,Pa. U5	9.875*	11.70	12.40	13.55	14.65
Warren O. R2	9.875*	11.70	12.40	13.55	14.65
Zanesville,O. A10	....	11.70†	12.40	13.55	14.65

	Stator
Vandergrift,Pa. U5	8.10
Mansfield,O. E6	8.10
Warren,O. R2 (Silicon Lowcore)	8.10

SHEETS (22 Ga., coils & cut lengths) Fully Processed (Semiprocessed ½c lower)	T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	15.70	16.30	16.80	17.85
Vandergrift,Pa. U5	15.70	16.30	16.80	17.85
Zanesville,O. A10	15.70	16.30	16.80	17.85

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-66	T-72
Brackenridge,Pa. A4	18.10	19.70	20.20	20.70	15.70††
Butler Pa. A10	....	19.70	20.20	20.70	....
Vandergrift Pa. U5	17.10	18.10	19.70	20.20	20.70	15.70
Warren,O. R2	....	....	....	....	....	15.70‡

*Semiprocessed. †Fully processed only. ‡Coils, annealed, semiprocessed ½c lower. ††Coils only.

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	8.00
Aliquippa,Pa. J5	8.00
Alton,Ill. L1	8.20
Atlanta A1	8.00
Bartonville,Ill. K4	8.10
Buffalo W12	8.00
Chicago W13	8.00
Cleveland A7, C20	8.00
Crawfordsville,Ind. M8	8.10
Donora,Pa. A7	8.00
Duluth A7	8.00
Fairfield,Ala. T2	8.00
Fostoria,O.(24) S1	8.10
Houston S5	8.25
Jacksonville Fla. M8	8.35
Johnstown Pa. B2	8.00
Joliet,Ill. A7	8.00
KansasCity,Mo. S5	8.25
Kokomo Ind. C16	8.10
LosAngeles B3	8.95
Minnequa,Colo. C10	8.25
Monessen,Pa. P7, P16	8.00
N.Tonawanda,N.Y. B11	8.00
Palmer,Mass. W12	8.30
Pittsburg,Calif. C11	8.95
Portsmouth,O. P12	8.00
Rankin,Pa. A7	8.00
S.Chicago,Ill. R2	8.00
S.SanFrancisco C10	8.95
SparrowsPoint,Md. B2	8.10
Sterling Ill.(1) N15	8.00
Sterling,Ill. N15	8.10
Struthers,O. Y1	8.00
Waukegan Ill. A7	8.00
Worcester,Mass. A7	8.30

WIRE, Cold Heading Carbon

Elyria,O. W8	8.00

WIRE, Gal'd., for ACSR

Bartonville,Ill. K4	12.65
Buffalo W12	13.40
Cleveland A7	12.65
Donora,Pa. A7	12.65
Duluth A7	12.65
Johnstown,Pa. B2	13.40
Minnequa,Colo. C10	12.775
Monessen,Pa. P7, P16	12.65
Muncie Ind. I-7	13.60
NewHaven,Conn. A7	12.95
Palmer,Mass. W12	13.70
Pittsburg,Calif. C11	13.45
Portsmouth O. P12	12.65
Roebling,N.J. R5	12.95
SparrowsPt.,Md. B2	13.50
Struthers,O. Y1	13.40
Trenton,N.J. A7	12.95
Waukegan,Ill. A7	12.65
Worcester,Mass. A7	12.95

WIRE, Upholstery Spring

Aliquippa,Pa. J5	9.75
Alton,Ill. L1	9.95
Buffalo W12	9.75
Cleveland A7	9.75
Donora,Pa. A7	9.75
Duluth A7	9.75
Johnstown,Pa. B2	9.75
KansasCity Mo. S5	10.00
LosAngeles B3	10.70
Minnequa,Colo. C10	9.95
Monessen,Pa. P7, P16	9.75
NewHaven Conn. A7	10.05
Palmer,Mass. W2	10.05
Pittsburg,Calif. C11	10.70
Portsmouth,O. P12	9.75
Roebling,N.J. R5	10.05
S.Chicago,Ill. R2	9.75
S.SanFrancisco C10	10.70
SparrowsPt.,Md. B2	9.85
Struthers,O. Y1	9.75
Trenton N.J. A7	10.05
Waukegan Ill. A7	9.75
Worcester,Mass. A7	10.05

WIRE, MB Spring, High-Carbon

Aliquippa,Pa. J5	9.75
Alton,Ill. L1	9.95
Bartonville,Ill. K4	9.85
Buffalo W12	9.75
Cleveland A7	9.75
Donora,Pa. A7	9.75
Duluth A7	9.75
Fostoria,O. S1	9.80
Johnstown,Pa. B2	9.75
KansasCity,Mo S5	10.00
LosAngeles B3	10.70
Milbury,Mass.(12) N6	10.05
Minnequa,Colo. C10	9.95
Monessen,Pa. P7, P16	9.75
Muncie,Ind. I-7	9.95
Palmer,Mass. W12	10.05
Pittsburg,Calif. C11	10.70
Portsmouth,O. P12	9.75
Roebling N.J. R5	10.05
S.Chicago, Ill. R2	9.75
S.SanFrancisco C10	10.70
SparrowsPt.,Md. B2	9.85
Struthers,O. Y1	9.75
Trenton N.J. A7	10.05
Waukegan,Ill. A7	9.75
Wor'ster,Mass.A7,J4,T6	10.05

WIRE, Fine & Weaving(8" Coils)

Alton,Ill. L1	16.50
Bartonville,Ill. K4	16.40
Chicago W13	16.30
Cleveland A7	16.30
Crawfordsville,Ind. M8	16.40
Fostoria,O. S1	16.30
Houston S5	16.55
Jacksonville Fla. M8	16.65
Johnstown,Pa. B2	16.30
KansasCity,Mo. S5	16.55
Kokomo,Ind. C16	16.30
Minnequa,Colo. C10	16.55
Monessen Pa. P16	16.30
Muncie,Ind. I-7	16.50
Palmer,Mass. W12	16.60
S.SanFrancisco C10	17.15
Waukegan,Ill. A7	16.30
Worcester,Mass. A7, J6	16.60

WIRE, Tire Bead

Bartonville,Ill. K4	17.15
Monessen,Pa. P16	17.15
Roebling,N.J. R5	17.65

ROPE WIRE (A)

Bartonville,Ill. K4	13.45
Buffalo W12	13.45
Fostoria,O. S1	13.45
Johnstown Pa. B2	13.45
Monessen,Pa. P7	13.45
Muncie,Ind. I-7	13.65
Palmer,Mass. W12	13.75
Portsmouth,O. P12	13.45
Roebling,N.J. R5	13.75
St. Louis L8	13.45
SparrowsPt.,Md. B2	13.55
Struthers,O. Y1	13.45
Worcester,Mass. J4	13.75

(A) Plow and Mild Plow; add 0.25c for Improved Plow.

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	12.35
Baltimore T6	12.65
Boston T6	12.65
Buffalo W12	12.35
Chicago W13	12.45
Cleveland A7	12.35
Crawfordsville,Ind. M8	12.35
Dover,O. G6	12.35
Farrell,Pa. S3	11.65
Fostoria,O. S1	12.35
FranklinPark,Ill. T6	12.45
Kokomo,Ind. C16	12.35
Massillon,O. R8	12.35
Milwaukee C23	12.55
Monessen,Pa. P7, P16	12.35
Palmer,Mass. W12	12.65
Pawtucket,R.I. N8	11.95
Philadelphia P24	12.65
Riverdale,Ill. A1	12.45
Rome,N.Y. R6	12.35
Sharon,Pa. S3	12.35
Trenton,N. J. R5	12.65
Warren,O. B9	12.35
Worcester,Mass. A7,T6	12.65

NAILS, Stock

	Col.
AlabamaCity,Ala. R2	173
Aliquippa,Pa. J5	173
Atlanta A11	175
Bartonville,Ill. K4	175
Chicago W13	173
Cleveland A9	173
Crawfordsville,Ind. M8	175
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S5	178
Jacksonville,Fla. M8	175
Johnstown,Pa. B2	173
Joliet,Ill. A7	173
KansasCity,Mo. S5	178
Kokomo,Ind. C16	175
Minnequa,Colo. C10	178
Monessen,Pa. P7	173
Pittsburg,Calif. C11	192
Rankin,Pa. A7	173
S.Chicago,Ill. R2	173
SparrowsPt.,Md. B2	175
Sterling,Ill. (7) N15	175
Worcester,Mass. A7	179

(To Wholesalers; per cwt)

Galveston,Tex. D7 ....$10.30

NAILS, Cut (100 lb keg)
To Dealers (33)

Wheeling,W.Va. W10 ..$9.80

POLISHED STAPLES

	Col.
AlabamaCity,Ala. R2	175
Aliquippa,Pa. J5	173
Atlanta A11	177
Bartonville,Ill. K4	177
Crawfordsville,Ind. M8	177
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S5	180
Jacksonville,Fla. M8	177
Johnstown,Pa. B2	175
Joliet,Ill. A7	173
KansasCity,Mo. S5	180
Kokomo,Ind. C16	177
Minnequa,Colo. C10	180
Pittsburg,Calif. C11	194
Rankin,Pa. A7	173
S.Chicago,Ill. R2	175
SparrowsPt.,Md. B2	177
Sterling,Ill. (7) N15	175
Worcester,Mass. A7	181

TIE WIRE, Automatic Baler (14½ Ga.) (per 97 lb Net Box)

Coil No. 3150	
AlabamaCity,Ala. R2	$9.24
Atlanta A11	10.36
Bartonville,Ill. K4	10.36
Buffalo W12	10.26
Chicago W13	9.24
Crawfordsville,Ind. M8	9.34
Donora,Pa. A7	9.24
Duluth A7	9.24
Fairfield,Ala. T2	9.24
Houston S5	10.51
Jacksonville,Fla. M8	9.34
Johnstown,Pa. B2	10.26
Joliet,Ill. A7	9.24
KansasCity,Mo. S5	10.51
Kokomo,Ind. C16	9.34
LosAngeles B3	11.05
Minnequa,Colo. C10	10.51
Pittsburg,Calif. C11	9.94
S.Chicago,Ill. R2	9.24
S.SanFrancisco C10	11.04
SparrowsPt.,Md. B2	10.36
Sterling,Ill. (37) N15	9.24

Coil No. 6500 Stand.	
AlabamaCity,Ala. R2	$9.54
Atlanta A11	10.70
Bartonville,Ill. K4	10.70
Buffalo W12	10.60
Chicago W13	9.54
Crawfordsville,Ind. M8	9.64
Donora,Pa. A7	9.54
Duluth A7	9.54
Fairfield,Ala. T2	9.54
Houston S5	10.85
Jacksonville,Fla. M8	9.64
Johnstown,Pa. B2	10.60
Joliet,Ill. A7	9.54
KansasCity,Mo. S5	10.85
Kokomo,Ind. C16	9.64
LosAngeles B3	11.40
Minnequa,Colo. C10	10.85
Pittsburg,Calif. C11	10.26
S.Chicago,Ill. R2	9.54
S.SanFrancisco C10	11.40
SparrowsPt.,Md. B2	10.70
Sterling,Ill. (37) N15	9.54

Coil No. 6500 Interim	
AlabamaCity,Ala. R2	$9.59
Atlanta A11	10.75
Bartonville,Ill. K4	10.75
Buffalo W12	10.65
Chicago W13	9.59
Crawfordsville,Ind. M8	9.69
Donora,Pa. A7	9.59
Duluth A7	9.59
Fairfield,Ala. T2	9.59
Houston S5	10.90
Jacksonville Fla. M8	9.69
Johnstown,Pa. B2	10.65
Joliet,Ill. A7	9.59
KansasCity,Mo. S5	10.90
Kokomo,Ind. C16	9.69
LosAngeles B3	11.45
Minnequa,Colo. C10	10.90
Pittsburg,Calif. C11	10.31
S.Chicago,Ill. R2	9.59
S.SanFrancisco C10	11.45
SparrowsPt., Md. B2	10.75
Sterling,Ill. (37) N15	9.59

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	212
Atlanta A11	214
Bartonville,Ill. K4	214
Crawfordsville,Ind. M8	214
Donora,Pa. A7	212
Duluth A7	212
Fairfield,Ala. T2	212
Houston S5	217
Jacksonville,Fla. M8	214
Joliet,Ill. A7	212
KansasCity,Mo. S5	217
Kokomo,Ind. C16	214
Minnequa,Colo. C10	217
Pittsburg,Calif. C11	236
S.SanFrancisco C10	236
SparrowsPt.,Md. B2	214
Sterling,Ill. (7) N15	214

FENCE POSTS

Birmingham C15	177
ChicagoHts.,Ill. C2, I-2	177
Duluth A7	177
Franklin,Pa. F5	177
Johnstown,Pa. B2	177
Marion,O. P11	177
Minnequa,Colo. C10	182
Tonawanda,N.Y. B12	177

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	193**
Aliquippa,Pa. J5	190§
Atlanta A11	198§
Bartonville,Ill. K4	198
Crawfordsville,Ind. M8	198
Donora,Pa. A7	193†
Duluth A7	193†
Fairfield,Ala. T2	193†
Houston S5	198**
Jacksonville,Fla. M8	198
Johnstown,Pa. B2	196§
Joliet,Ill. A7	193†
KansasCity,Mo. S5	198**
Kokomo,Ind. C16	195†
Minnequa,Colo. C10	198**
Monessen,Pa. P7	196§
Pittsburg,Calif. C11	213†
Rankin,Pa. A7	193†
S.Chicago,Ill. R2	193**
S.SanFrancisco C10	213*
SparrowsPoint,Md. B2	198§
Sterling,Ill. (7) N15	198††

WOVEN FENCE, 9-15 Ga.

	Col.
Ala.City,Ala. R2	187**
Aliq'ppa,Pa. 9-11½ga. J5	190§
Atlanta A11	192§
Bartonville,Ill. K4	192
Crawfordsville,Ind. M8	192
Donora,Pa. A7	187†
Duluth A7	187†
Fairfield,Ala. T2	187†
Houston S5	192**
Jacksonville,Fla. M8	192
Johnstown,Pa. (43) B2	190§
Joliet,Ill. A7	187†
KansasCity,Mo. S5	192**
Kokomo,Ind. C16	189†
Minnequa,Colo. C10	192**
Pittsburg,Calif. C11	210†
Rankin,Pa. A7	187†
S.Chicago,Ill. R2	187**
Sterling,Ill. (7) N15	192††

WIRE (16 gage)

	An'ld Stone	Galv. Stone
Ala.City,Ala. R2	17.85	19.40**
Aliq'ppa,Pa. J5	17.85	19.65
Bartonville K4	17.95	19.75
Cleveland A7	17.85	
Craw'dsville M8	17.95	19.80‡‡
Fostoria,O. S1	18.35	19.90†
Houston S5	18.10	19.65**
Jacksonville M8	17.95	19.80‡‡
Johnstown B2	17.85	19.65§§
Kan.City,Mo. S5	18.10	
Kokomo C16	17.25	18.80†
Minnequa C10	18.10	19.65**
P'lm'r,Mass. W12	18.15	19.70†
Pitts.,Calif. C11	18.20	19.75†
S.SanFran. C10	18.20	19.75**
Sterling(37) N15	17.25	19.05††
SparrowsPt. B2	17.95	19.75§
Waukegan A7	17.85	19.40†
Worcester A7	18.15	

WIRE, Merchant Quality

(6 to 8 gage)	An'ld	Galv.
Ala.City,Ala. R2	9.00	9.55**
Aliquippa J5	8.65	9.325§
Atlanta(48) A11	9.10	9.775§
Bartonville(48) K4	9.10	9.775
Buffalo W12	9.00	9.55†
Cleveland A7	9.00	
Crawfordsville M8	9.10	9.80‡‡
Donora,Pa. A7	9.00	9.55†
Duluth A7	9.00	9.55†
Fairfield T2	9.00	9.55†
Houston(48) S5	9.25	9.80**
Jack'ville,Fla. M8	9.10	9.80‡‡
Johnstown B2(48)	9.00	9.675§
Joliet,Ill. A7	9.00	9.55†
Kans.City(48) S5	9.25	9.80**
Kokomo(48) S16	9.10	9.65†
LosAngeles B3	9.95	10.625§
Monessen(48) P7	8.65	9.35§
Palmer,Mass. W12	9.30	9.85†
Pitts.,Calif. C11	9.95	10.50†
Rankin,Pa. A7	9.00	9.55†
S.Chicago R2	9.00	9.55**
S.SanFran. C10	9.95	10.50**
Spar'waPt.(48)B2	9.10	9.775§
St'ling(1)(48)N15	9.00	9.70§§
Struthers,O. Y1	9.00	9.65†
Worcester,Mass.A7	9.30	9.85†

Based on zinc price of: *13.50. †5c. §10c. ‡Less than 10c. ††10.50c. ‡‡11.00c. **Subject to zinc equalization extras. §§11.50c.

FASTENERS

(Base discounts, shipments of one to four containers, per cent off list, f.o.b. mill)

BOLTS

Machine Bolts
Full Size Body (cut thread)

½ in. and smaller:	
3 in. and shorter	55.0
3¼ in. thru 6 in.	50.0
Longer than 6 in.	37.0
⅝ in., 3 in. & shorter	47.0
3¼ in. thru 6 in.	40.0
Longer than 6 in.	31.0
¾ in. thru 1 in.:	
6 in. and shorter	37.0
Longer than 6 in.	31.0
1⅛ in. and larger:	
All lengths	31.0

Undersize Body (rolled thread)

½ in. and smaller:	
3 in. and shorter	55.0
3¼ in. thru 6 in.	50.0

Carriage Bolts
Full Size Body (cut thread) & Undersize Body (rolled thread)

½ in. and smaller:	
6 in. and shorter	48.0
Larger diameters and longer lengths	35.0

Lag, Plow, Tap, Blank, Step, Elevator, Tire, and Fitting Up Bolts

½ in. and smaller:	
6 in. and shorter	48.0
Larger diameters and longer lengths	35.0

High Tensile Structural Bolts
(Reg. semifinished hex head bolts, heavy semifinished hex nuts. Bolts — High-carbon steel, heat treated, Spec. ASTM A-325, in bulk, Full keg quantity)

⅝ in. diam.	50.0
¾ in. diam.	47.0
⅞ and 1 in. diam.	43.0
1⅛ and 1¼ in. diam.	34.0

NUTS
(Keg or case quantity and over)

Square Nuts, Reg. & Heavy:
All sizes 56.0

(Full container)

Hex Nuts, Reg. & Heavy Hot Pressed & Cold Punched:

¾ in. and smaller	62.0
⅞ in. to 1⅛ in., incl.	56.0
1⅛ in. and larger	51.5

Hex Nuts, Semifinished, Heavy (Incl. Slotted):

¾ in. and smaller	62.0
⅞ in. to 1⅛ in., incl.	56.0
1⅛ in. and larger	51.5

Hex Nuts, Finished (Incl. Slotted and Castellated):

⅞ in. and smaller	65.0
1 in. to 1½ in., incl.	57.0
1⅝ in. and larger	51.5

Semifinished Hex Nuts, Reg. (Incl. Slotted):

⅝ in. and smaller	62.0
¾ in. to ⅞ in. incl.	65.0
1 in. to 1½ in., incl.	57.0
1⅝ in. and larger	51.5

CAP AND SETSCREWS
(Base discounts, packages, per cent off list, f.o.b. mill)

Hex Head Cap Screws, Coarse or Fine Thread, Bright:

6 in. and shorter:	
⅝ in. and smaller	35.0
¾, ⅞, and 1 in.	16.0
Longer than 6 in.:	
⅝ in. and smaller	3.0
¾, ⅞, and 1 in.	+11.0

High Carbon, Heat Treated:

6 in. and shorter:	
⅝ in. and smaller	20.0
¾, ⅞, and 1 in.	+ 5.0
Longer than 6 in.:	
⅝ in. and smaller	+19.0
¾, ⅞, and 1 in.	+39.0

Flat Head Cap Screws:

¼ in. and smaller, 6 in. and shorter	+85.0

Setscrews, Square Head, Cup Point, Coarse Thread:

Through 1 in. diam.:	
6 in. and shorter	+ 5.0
Longer than 6 in.	+29.0

RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburgh, f.o.b. Chicago and/or freight equalized with Birmingham except where equalization is too great.

Structural ½ in., larger 12.85
⅞ in. and smaller by 6 in. and shorter: 15.0%.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	27.24	23.13
1¼	13	....	32.25	24.41
1½	13	30.42	35.65	26.98
1¾	13	35.94	42.12	31.89
2	13	40.28	47.21	35.74
2¼	13	45.36	53.17	40.26
2¾	12	49.24	57.72	43.70
2½	12	54.23	63.57	48.13
2¾	12	58.73	68.83	52.13
3	12	62.42	73.40	55.59

RAILWAY MATERIALS

Rails	Standard No. 1	Standard No. 2	Standard All No. 2	Tee Rails 60 lb Under
Bessemer,Pa. U5	5.75	5.65	....	6.725
Ensley,Ala. T2	5.75	5.65	....	6.725
Fairfield,Ala. T2	....	....	....	6.725
Gary,Ind. U5	5.75	5.65	....	....
Huntington,W.Va. C15	....	....	....	6.725
Johnstown,Pa. B2	....	....	....	(16)6.725
Lackawanna,N.Y. B2	5.75	5.65	....	6.725
Minnequa,Colo. C10	5.75	5.65	....	7.225
Steelton,Pa. B2	5.75	5.65	....	....
Williamsport,Pa. S19	....	....	....	6.725

TIE PLATES

Fairfield,Ala. T2	6.875
Gary,Ind. U5	6.875
Lackawanna,N.Y. B2	6.875
Minnequa,Colo. C10	6.875
Seattle B3	7.025
Steelton,Pa. B2	6.875
Torrance,Calif. C11	6.875

JOINT BARS

Bessemer,Pa. U5	7.25
Fairfield,Ala. T2	7.25
Joliet,Ill. U5	7.25
Lackawanna,N.Y. B2	7.25
Minnequa,Colo. C10	7.25
Steelton,Pa. B2	7.25

AXLES

Ind.Harbor,Ind. S13	9.125
Johnstown,Pa. B2	9.125

TRACK BOLTS, Untreated

Cleveland R2	15.35
KansasCity,Mo. S5	15.35
Lebanon,Pa. B2	15.35
Minnequa,Colo. C10	15.35
Pittsburgh P14	14.75
Seattle B3	15.85

SCREW SPIKES

Lebanon,Pa. B2	15.10

STANDARD TRACK SPIKES

Fairfield,Ala. T2	9.75
Ind.Harbor,Ind. I-2,Y1	10.10
KansasCity,Mo. S5	10.10
Lebanon,Pa. B2	10.10
Minnequa,Colo. C10	10.10
Pittsburgh J5	10.10
Seattle B3	10.60
S.Chicago,Ill. R2	10.10
Struthers,O. Y1	10.10
Youngstown R2	10.10

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1⅛ to under 1 7/16 in.; 1 7/16 to under 1 15/16 in., 6.70c; 1 15/16 to 8 in., inclusive, 7.05c.
(6) Chicago or Birm. base.
(7) Chicago base 2 cols. lower.
(8) 16 Ga. and heavier.
(9) Merchant quality; add 0.35c for special quality.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ¾" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(21) New Haven, Conn., base.
(22) Deld. San Francisco Bay area.
(23) Special quality.
(24) Deduct 0.05c, finer than 15 Ga.
(25) Bar mill bands.
(26) Deld. in mill zone, 6.295c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c.
(31) Widths over ⅝ in.; 7.375c, for widths ⅝ in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) Chicago base, 10 points lower.
(38) 13 Ga. & lighter; 60" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. in mill zone or within switching limits, 5.635c.
(43) 9-14½ Ga.
(44) To fabricators.
(48) 6-7 Ga.
(49) 3½ in. and smaller rounds; 9.65c, over 3½ in. and other shapes.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate.

	Basic	No. 2 Foundry	Malleable	Bessemer
Birmingham District				
Birmingham R2	62.00	62.50**	....	....
Birmingham U6	....	62.50**	66.50	....
Woodward, Ala. W15	62.00*	62.50**	66.50	....
Cincinnati, deld.	....	70.20	....	....
Buffalo District				
Buffalo H1, R2	66.00	66.50	67.00	67.50
N. Tonawanda, N.Y. T9	....	66.50	67.00	67.50
Tonawanda, N.Y. W12	66.00	66.50	67.00	67.50
Boston, deld.	77.29	77.79	78.29	....
Rochester, N.Y., deld.	69.02	69.52	70.02	....
Syracuse, N.Y., deld.	70.12	70.62	71.12	....
Chicago District				
Chicago I-3	66.00	66.50	66.50	67.00
S. Chicago, Ill. R2	66.00	66.50	66.50	67.00
S. Chicago, Ill. W14	66.00	....	66.50	67.00
Milwaukee, deld.	69.02	69.52	69.52	70.02
Muskegon, Mich., deld.	....	74.52	74.52	....
Cleveland District				
Cleveland R2, A7	66.00	66.50	66.50	67.00
Akron, Ohio, deld.	69.52	70.02	70.02	70.52
Mid-Atlantic District				
Birdsboro, Pa. B10	68.00	68.50	69.00	69.50
Chester, Pa. P4	68.00	68.50	69.00	....
Swedeland, Pa. A3	68.00	68.50	69.00	69.50
NewYork, deld.	....	75.50	76.00	....
Newark, N.J., deld.	72.69	73.19	73.69	74.19
Philadelphia, deld.	70.41	70.91	71.41	71.99
Troy, N.Y. R2	68.00	68.50	69.00	69.50
Pittsburgh District				
NevilleIsland, Pa. P6	66.00	66.50	66.50	67.00
Pittsburgh (N&S sides), Aliquippa, deld.	....	67.95	67.95	68.48
McKeesRocks, Pa., deld.	....	67.60	67.60	68.13
Lawrenceville, Homestead, Wilmerding, Monaca, Pa., deld.	....	68.26	68.26	68.79
Verona, Trafford, Pa., deld.	68.29	68.82	68.82	69.35
Brackenridge, Pa., deld.	68.60	69.10	69.10	69.63
Midland, Pa. C18	66.00	....	....	....
Youngstown District				
Hubbard, Ohio Y1	....	....	66.50	....
Sharpsville, Pa. S6	66.00	....	66.50	67.00
Youngstown Y1	....	....	66.50	....
Mansfield, Ohio, deld.	71.30	....	71.80	72.30

	Basic	No. 2 Foundry	Malleable	Bessemer
Duluth I-3	66.00	66.50	66.50	67.00
Erie, Pa. I-3	66.00	66.50	66.50	67.00
Everett, Mass. E1	67.50	68.00	68.50	....
Fontana, Calif. K1	75.00	75.50	....	....
Geneva, Utah C11	66.00	66.50	....	....
GraniteCity, Ill. G4	67.90	68.40	68.90	....
Ironton, Utah C11	66.00	66.50	....	....
Minnequa, Colo. C10	66.00	66.50	69.00	....
Rockwood, Tenn. T3	....	62.50‡	66.50	....
Toledo, Ohio I-3	66.00	66.50	66.50	67.00
Cincinnati, deld.	72.94	73.44	....	....

*Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.
**Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.50.
‡Phos. 0.50% up; Phos. 0.30-0.49, $63.50.

PIG IRON DIFFERENTIALS

Silicon: Add 75 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos. iron on which base is 1.75-2.00%.

Manganese: Add 50 cents per ton for each 0.25% manganese over 1% or portion thereof.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.01-6.50% silicon; add 75c for each 0.50% silicon or portion thereof over the base grade within a range of 6.50 to 11.50%; starting with silicon over 11.50% add $1.50 per ton for each 0.50% silicon or portion thereof up to 14%; add $1 for each 0.50% Mn over 1%)

Jackson, Ohio I-3, J1	$78.00
Buffalo H1	79.25

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.25 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

CalvertCity, Ky. P15	$99.00
NiagaraFalls, N.Y. P15	99.00
Keokuk, Iowa Open-hearth & Pdry. $9 freight allowed K2	103.50
Keokuk, Iowa O.H. & Pdry, 12½ lb pigiets, 16% Si, max fr'gt allowed up to $9, K2	106.50

LOW PHOSPHORUS PIG IRON, Gross Ton

Lyles, Tenn. T3 (Phos. 0.035% max)	$73.00
Rockwood, Tenn. T3 (Phos. 0.035% max)	73.00
Troy, N.Y. R2 (Phos. 0.035% max)	73.00
Philadelphia, deld.	81.67
Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Duluth I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Erie, Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
NevilleIsland, Pa. P6 (Intermediate) (Phos. 0.036-0.075% max)	71.00

Steel Service Center Products

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 15 cents per 100 lb except: Denver, Moline, Norfolk, Richmond, Washington, 20 cents; Baltimore, Boston, Los Angeles, New York, Philadelphia, Portland, Spokane, San Francisco, 10 cents; Atlanta, Birmingham, Chattanooga, Houston, Seattle, no charge.

	SHEETS				STRIP	BARS			Standard Structural Shapes	PLATES	
	Hot-Rolled	Cold-Rolled	Galv. 10 Ga.†	Stainless Type 302	Hot-Rolled*	H.R. Rounds	C.F. Rds.‡	H.R. Alloy 4140††[9]		Carbon	Floor
Atlanta	8.59§	9.86§	10.13	....	8.91	9.39	13.24#	....	9.40	9.29	11.21
Baltimore	8.55	9.25	9.99	....	9.05	9.45	11.85#	15.48	9.55	9.00	10.50
Birmingham	8.18	9.45	10.46	....	8.51	8.99	....	....	9.00	8.89	10.90
Boston	9.31	10.40	11.97	53.50	9.73	10.11	13.39#	15.71	10.01	10.02	11.85
Buffalo	8.40	9.60	10.85	55.98	8.75	9.15	11.45#	15.40	9.25	9.20	10.75
Chattanooga	8.35	9.69	9.65	....	8.40	8.77	10.48	....	8.88	8.80	10.66
Chicago	8.25	9.45	10.50	53.00	8.51	8.99	9.15	15.05	9.00	8.89	10.20
Cincinnati	8.43	9.51	10.95	53.43	8.83	9.31	11.53#	15.37	9.56	9.27	10.53
Cleveland	8.36	9.54	10.65	52.33	8.63	9.10	11.25#	15.16	9.39	9.13	10.44
Dallas	8.80	9.30	....	....	8.85	8.80	....	....	8.75	9.15	10.40
Denver	9.40	11.84	12.94	....	9.43	9.80	11.19	....	9.84	9.76	11.08
Detroit	8.51	9.71	11.25	56.50	8.88	9.30	9.51	15.33	9.56	9.26	10.46
Erie, Pa.	8.35	9.45	9.95[10]	....	8.60	9.10	11.25	....	9.35	9.10	10.60
Houston	8.40	8.90	10.29	52.00	8.45	8.40	11.60	15.75	8.35	8.75	10.10
Jackson, Miss.	8.52	9.79	....	....	8.84	9.82	10.68	....	9.33	9.22	11.03
Los Angeles	8.70[3]	10.80[3]	12.15[3]	57.60	9.15	9.10[3]	12.95[3]	16.35	9.00[3]	9.10[3]	11.30[3]
Memphis, Tenn.	8.59	9.80	....	....	8.84	9.32	11.25#	....	9.33	9.22	10.86
Milwaukee	8.39	9.59	11.04	....	8.65	9.13	9.39	15.19	9.22	9.03	10.34
Moline, Ill.	8.55	9.80	....	....	8.84	8.95	9.15	....	8.99	8.91	....
New York	9.17	10.49	11.10	53.08	9.64	9.99	13.25#	15.50	9.74	9.77	11.05
Norfolk, Va.	8.40	....	....	....	9.10	9.10	12.00	....	9.40	8.85	10.35
Philadelphia	8.20	9.25	10.61	52.71	9.25	9.40	11.95#	15.48	9.10	9.15	10.40**
Pittsburgh	8.35	9.55	10.90	52.00	8.61	8.99	11.25#	15.05	9.00	8.89	10.20
Richmond, Va.	8.40	....	10.40	....	9.10	9.00	....	....	9.40	8.85	10.35
St. Louis	8.63	9.83	11.28	....	8.89	9.37	9.78	15.43	9.48	9.27	10.58
St. Paul	8.79	10.04	11.49	....	8.84	9.21	9.86	....	9.38	9.30	10.49
San Francisco	9.65	11.10	11.40	55.10	9.75	10.15	13.00	16.00	9.85	10.00	12.35
Seattle	10.30	11.55	12.50	56.52	10.25	10.50	14.70	16.80[3]	10.20	10.10	12.50
South'ton, Conn.	9.07	10.33	10.71	....	9.48	9.74	....	....	9.57	9.57	10.91
Spokane	10.35	11.55	12.55	57.38	10.80	11.05	14.70	16.80	10.25	10.15	13.05
Washington	9.15	....	....	....	9.65	10.05	12.50	....	10.15	9.60	11.10

*Prices do not include gage extras; †prices include gage and coating extras; ‡includes 35-cent bar quality extras; §42 in. and under; **⅛ in. and heavier; ††as annealed; ‡‡⅝ in. to 4 in. wide, inclusive; #net price, 1 in. round C-1018.

Base quantities, 2000 to 4999 lb except as noted; cold-finished bars, 2000 lb and over except in Seattle, 2000 to 3999 lb; stainless sheets, 8000 lb except in Chicago, New York, Boston, Seattle, 10,000 lb and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb, except in Seattle, 30,000 lb and over; [3]—30,000 lb; [9]—1000 to 4999 lb; [8]—1000 to 1999 lb; [10]—2000 lb and over.

Refractories

Fire Clay Brick (per 1000 pieces*)

High-Heat Duty: Ashland, Grahn, Hayward, Hitchens, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Winburne, Snow Shoe, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parrall, Portsmouth, Ohio, Ottawa, Ill., Stevens Pottery, Ga., Canon City, Colo., $140; Salina, Pa., $145; Niles, Ohio, $138; Cutler, Utah, $175.

Super-Duty: Ironton, Ohio, Vandalia, Mo., Olive Hill, Ky., Clearfield, Salina, Winburne, Snow Shoe, Pa., New Savage, Md., St. Louis, $185; Stevens Pottery, Ga., $195; Cutler, Utah, $248.

Silica Brick (per 1000 pieces*)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Pt. Matilda, Pa., Portsmouth, Ohio, Hawstone, Pa., St. Louis, $158; Warren, Niles, Windham, Ohio, Hays, Latrobe, Morrisville, Pa., $163; E. Chicago, Ind., Joliet, Rockdale, Ill., $168; Canon City, Colo., $173; Lehi, Utah, $183; Los Angeles, $185.

Super-Duty: Sproul, Hawstone, Pa., Niles, Warren, Windham, Ohio, Leslie, Md., Athens, Tex., $158; Morrisville, Hays, Latrobe, Pa., $163; E. Chicago, Ind., St. Louis, $168; Curtner, Calif., $185; Canon City, Colo., $183.

Semisilica Brick (per 1000 pieces*)

Woodbridge, N. J., Canon City, Colo., $140; Philadelphia, Clearfield, Pa., $145.

Ladle Brick (per 1000 pieces*)

Dry Pressed: Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Vanport, Pa., Mexico, Vandalia, Mo., Wellsville, Irondale, New Salisbury, Ohio, $96.75; Clearfield, Pa., Portsmouth, Ohio, $102.

High-Alumina Brick (per 1000 pieces*)

50 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., Danville, Ill., $253; Philadelphia, $265; Clearfield, Pa., $230; Orviston, Snow Shoe, Pa., $260.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $310; Danville, Ill., $313; Clearfield, Orviston, Snow Shoe, Pa., $320; Philadelphia, $325.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo. $350; Danville, Ill., $353; Clearfield, Orviston, Snow Shoe, Pa., $360; Philadelphia, $365.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., St. Louis, $188; Ottawa, Ill., $205.

Nozzles (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., St. Louis, $310.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., $234.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, Gibsonburg, Narlo, Ohio, $16.75; Thornton, McCook, Ill., $17; Dolly Siding, Bonne Terre, Mo., $15.60.

Magnesite (per net ton)

Domestic, dead-burned, ½ in. grains with fines: Chewelah, Wash., Luning, Nev., $46; ⅜ in. grains with fines: Baltimore, $73.

*—9 in. x 4½ x 2.50 sts.

Fluorspar

Metallurgical grades, f.o.b. shipping point in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $37-$41; 70%, $36-$40; 60%, $33-$36.50. Imported, net ton, f.o.b. cars point of entry, duty paid, metallurgical grade; European, $30-$33, contract; Mexican, all rail, duty paid, $25; barge, Brownsville, Tex., $27.

Metal Powder

(Per pound f.o.b. shipping point in ton lots for minus 100 mesh, except as noted)

	Cents
Sponge Iron, Swedish:	
98% Fe:	
F.o.b. Camden or Riverton, N. J., freight allowed east of Mississippi river, ocean bags, 23,000 lb and over	11.25
Sponge Iron, Domestic, 98% Fe:	
F.o.b. Riverton, N. J., freight allowed east of Mississippi River:	
100 mesh, 100 lb bags	11.25
100 mesh, 100 lb pails	9.10‡
40 mesh, 100 lb bags	8.10
Electrolytic Iron, Melting stock, 99.87% Fe, irregular fragments of ⅛ in. x 1.3 in.	28.75
(In contract lots of 240 tons price is 22.75c)	
Annealed, 99.5% Fe...	36.50
Unannealed (99 + % Fe)	36.00
Unannealed (99 + % Fe) (minus 325 mesh)	59.00
Powder Flakes (minus 16, plus 100 mesh)..	29.00
Carbonyl Iron:	
98.1-99.9%, 3 to 20 microns, depending on grade, 93.00-290.00 in standard 200-lb containers; all minus 200 mesh	
Aluminum:	
Atomized, 500-lb drum, freight allowed	
Carlots	38.50
Ton lots	40.50
Antimony, 500-lb lots	42.00*
Brass, 5000-lb lots	33.50-49.60†
Bronze, 5000-lb lots	50.50-54.60†
Copper:	
Electrolytic	14.25*
Reduced	14.25*
Lead	7.50*
Manganese, Electrolytic:	
Minus 50 mesh	43.00
Nickel	80.60
Nickel-Silver, 5000-lb lots	51.60-56.00†
Phosphor-Copper, 5000-lb lots	62.80
Copper (atomized) 5000-lb lots	43.30-51.80†
Solder	7.00*
Stainless Steel, 304	$1.07
Stainless Steel, 316	$1.26
Tin	14.00*
Zinc, 5000-lb lots	19.00-32.20‡
Tungsten:	Dollars
Carbon reduced, 98.8% min, minus 65 mesh	nom.**
1000 lb	2.80
less 1000 lb	2.95
Chromium, electrolytic 99.8% Cr, min metallic basis	5.00

*Plus cost of metal. †Depending on composition. ‡Depending on mesh. §Cutting and scarfing grade. **Depending on price of ore.

Electrodes

Threaded with nipple; unboxed, f.o.b. plant

GRAPHITE

—Inches— Diam	Length	Per 100 lb
2	24	$64.00
2½	30	41.50
3	40	39.25
4	40	37.00
5⅛	40	36.50
6	60	33.25
7	60	29.75
8, 9, 10	60	29.50
12	72	28.25
14	60	28.25
16	72	27.25
17	60	27.25
18	72	27.00
20	72	26.50
24	84	27.25

CARBON

8	60	14.25
10	60	13.80
12	60	14.75
14	60	14.75
14	72	12.55
17	60	12.65
17	72	12.10
20	90	11.55
24	72, 84	11.95
24	96	12.10
30	84	12.00
35, 40	110	11.60
40	100	12.50

Ores

Lake Superior Iron Ore

(Prices effective for the 1958 shipping season, gross ton, 51.50% iron natural rail of vessel, lower lake ports.)

Mesabi bessemer	$11.60
Mesabi nonbessemer	11.45
Old Range bessemer	11.85
Old Range nonbessemer	11.70
Open-hearth lump	12.70
High phos	11.45

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect Jan. 30, 1957, and increases or decreases after that date are absorbed by the seller.

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

New Jersey, foundry and basic 62-64% concentrates	nom.

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 65%	23.00
N. African hematite (spot)	nom
Brazilian iron ore, 68.5%	22.60

Tungsten Ore

Net ton, unit

Foreign wolframite, good commercial quality	$11.00-$11.25*
Domestic, concentrates f.o.b. milling points	16.00-17.00†

*Before duty. †Nominal.

Manganese Ore

Mn 46-48%, Indian (export tax included) $0.95-$1 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; other than Indian, nominal; contracts by negotiation.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and Rhodesian	
48% 3:1	$42.00-44.00
48% 2.8:1	38.00-40.00
48% no ratio	29.00-31.00
South African Transvaal	
44% no ratio	22.00-23.00
48% no ratio	29.00-31.00
Turkish	
48% 3:1	51.00-55.00
Domestic	
Rail nearest seller	
18% 3:1	39.00

Molybdenum

Sulfide concentrate, per lb of Mo content, mines, unpacked	$1.23

Antimony Ore

Per short ton unit of Sb content, c.i.f. seaboard	
50-55%	$2.25-2.40
60-65%	2.50-3.10

Vanadium Ore

Cents per lb V_2O_5

Domestic	31.00

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, Pa., furnace	$14.75-15.25
Connellsville, Pa., foundry	18.00-18.50

Oven Foundry Coke

Birmingham, ovens	$30.35
Cincinnati, deld.	33.34
Buffalo, ovens	32.00
Detroit, ovens	32.00
Pontiac, Mich., deld.	33.95
Saginaw, Mich., deld.	35.53
Erie, Pa., ovens	32.00
Everett, Mass., ovens:	
New England, deld.	33.55*
Indianapolis, ovens	31.25
Ironton, Ohio, ovens	30.50
Cincinnati, deld.	33.54
Kearny, N. J., ovens	31.25
Milwaukee, ovens	32.00
Neville Island (Pittsburgh), Pa., ovens	30.75
Painesville, Ohio, ovens	32.00
Cleveland, deld.	34.19
Philadelphia, ovens	31.00
St. Louis, ovens	33.00
St. Paul, ovens	31.25
Chicago, deld.	34.73
Swedeland, Pa., ovens	31.00
Terre Haute, Ind., ovens	31.25

*Within $5.15 freight zone from works.

Coal Chemicals

(Representative prices)

Cents per gal., f.o.b. tank cars or tank trucks, plant.	
Pure benzene	31.00
Xylene, industrial grade	29.00
Creosote	22.00
Naphthalene, 78 deg	5.00
Toluene, one deg (del. east of Rockies)	25.00
Cents per lb, f.o.b. tank cars or tank trucks, del.	
Phenol, 90 per cent grade	15.50
Per net ton bulk, f.o.b. cars or trucks, plant	
Ammonium sulfate, regular grade	$32.00

Imported Steel

(Base per 100 lb, landed, duty paid, based on current ocean rates. Any increase in these rates is for buyer's account. Source of shipment: Western continental European countries.)

	North Atlantic	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A 305	$5.40	$5.40	$5.30	$5 75
Bar Size Angles	5.10	5.10	5.00	5.43
Structural Angles	5.10	5.10	4.90	5.43
I-Beams	5.06	5.06	4.96	5.40
Channels	5.06	5.06	4.96	5.40
Plates (basic bessemer)	6.62	6.62	6.62	6.94
Sheets, H.R.	8.20	8.20	8.20	8.50
Sheets, C.R. (drawing quality)	8.75	8.75	8.75	9.12
Furring Channels, C.R., 1000 ft, ¾ x 0.30 lb per ft	25.76	25.64	25.64	26.51
Barbed Wire (†)	6.60	6.60	6.60	6.95
Merchant Bars	5.40	5.40	5.35	5.90
Hot-Rolled Bands	7.15	7.15	7.15	7.55
Wire Rods, Thomas Commercial No. 5	5.19	5.32	5.14	5.49
Wire Rods, O.H. Cold Heading Quality No. 5	5.09	6.22	6.04	6.34
Bright Common Wire Nails (§)	7.89	7.75	7.67	8.26

†Per 82 lb net reel. §Per 100-lb kegs, 20d nails and heavier.

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Ferroalloys

MANGANESE ALLOYS

Spiegeleisen: Carlot, per gross ton, Palmerton, Neville Island, Pa. 21-23% Mn, $105; 19-21% Mn, 1-3% Si, $102.50; 16-19% Mn, $100.50.

Standard Ferromanganese: (Mn 74-76%, C 7% approx) base price per net ton, $245, Johnstown, Duquesne, Sheridan, Neville Island, Pa.; Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Add or subtract $2 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively. (Mn 79-81%). Lump $253 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

High-Grade Low-Carbon Ferromanganese: (Mn 85-95%). Carload, lump, bulk, max 0.07% C, 35.1c per lb of contained Mn, carload packed 36.4c, ton lots 37.9c, less ton 39.1c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices, 3c for max 0.03% C, 3.5c for max 0.5% C, and 6.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.006% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.25-1.5%, Si 1.5% max). Carload, lump, bulk, 25.5c per lb of contained Mn; packed, carload 26.8c, ton lot 28.4c, less ton 29.6c.

Manganese Metal: 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2%). Carload, lump, bulk, 45c per lb of metal; packed, carload 45.75c, ton lot 47.25c, less ton lot. Delivered. Spot, add 2c.

Electrolytic Manganese Metal: Min carload, bulk, 33.25c; 2000 lb to min carload, 36c; less ton, 38c; 50 lb cans, add 0.5c per lb. Premium for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or any point east of Mississippi River; or f.o.b. Marietta, O., freight allowed.

Silicomanganese: (Mn 65-68%). Carload, lump, bulk, 1.50% C grade, 18-20% Si, 12.8c per lb of alloy. Packed, c.l. 14c, ton 14.45c, less ton 15.45c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% grade, Si 12-14.5%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lot, 2" x D, $1.50 per lb of contained Ti; less ton to 300 lb, $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lot $1.35, less ton to 300 lb $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract min c.l. $240 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi River and north of Baltimore and St. Louis. Spot, $245.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4%). Contract, c.l. $290 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed. Spot, $295.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l. lump, bulk 28.75c per lb of contained Cr; c.l. packed 30.30c, ton lot 32.05c, less ton 33.45c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: Cr 63-66% (Simplex), carload, lump, bulk, C 0.025% max, 36.75c per lb contained Cr; 0.010% max, 37.75c. Ton lot, add 3.5c; less ton, add 5.2c. Delivered.

Cr 67-71%, carload, lump, bulk, C 0.02% max, 41.00c per lb contained Cr; 0.025% max, 39.75c; 0.05% max, 39.00c; 0.10% max, 38.50c; 0.20% max, 38.25c; 0.50% max, 38.00c; 1.0% max, 37.75c; 1.5% max, 37.50c; 2.0% max, 37.25c. Ton lot, add 3.4c; less ton lot, add 5.1c. Delivered.

Foundry Ferrochrome, High-Carbon: (Cr 61-66%, C 5-7%, Si 7-10%). Contract, c.l., 2 in. x D, bulk 30.8c per lb of contained Cr. Packed, c.l. 32.4c, ton 34.2c, less ton 35.7c. Delivered. Spot, add 0.25c.

Foundry Ferrosilicon Chrome: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload packed, 8M x D, 21.25c per lb of alloy, ton lot 22.50c; less ton lot 23.70c. Delivered. Spot, add 0.25c.

Ferrochrome-Silicon: Cr 39-41%, Si 42-45%, C 0.05% max or Cr 33-36%, Si 45-48%, C 0.05% max. Carload, lump, bulk, 3" x down and 2" x down, 28.25c per lb contained Cr, 14.60c per lb contained Si, 0.75" x down 29.40c per lb contained Cr, 14.60c per lb contained Si.

Chromium Metal, Electrolytic: Commercial grade (Cr 99.8% min, metallic basis, Fe 0.2% max). Contract, carlot, packed, 2" x D plate (about ¼" thick) $1.15 per lb, ton lot $1.17, less ton lot $1.19. Delivered. Spot, add 5c.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth grade (V 50-55%, Si 8% max, C 3% max). Contract, any quantity, $3.20 per lb of contained V. Delivered. Spot, add 10c. **Special Grade:** (V 50-55% or 70-75%, Si 2% max, C 0.5% max) $3.30. **High Speed Grade:** (V 50-55% or 70-75%, Si 1.50% max, C 0.20% max) $3.40.

Grainal: Vanadium Grainal No. 1 $1.05 per lb; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lot, packed, $1.38 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

50% Ferrosilicon: Contract, carload, lump, bulk, 14.6c per lb contained Si. Packed, c.l. 17.1c, ton lot 18.55c, less ton 20.20c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.45c to 50% ferrosilicon prices.

65% Ferrosilicon: Contract, carload, lump, bulk, 15.75c per lb contained silicon. Packed, c.l. 17.75c, ton lot 19.55c, less ton 20.9c. Delivered. Spot, add 0.35c.

75% Ferrosilicon: Contract, carload, lump, bulk, 16.9c per lb of contained Si. Packed, c.l. 18.8c, ton lot 20.45c, less ton 21.7c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Contract, carload, lump, bulk, 20c per lb of contained Si. Packed, c.l. 21.65c, ton lot 23.05c, less ton 24.1c. Delivered. Spot, add 0.25c.

Silicon Metal: (98% min Si, 1.00% max Fe, 0.07% max Ca). C.l. lump, bulk, 21.5c per lb of Si. Packed, c.l. 23.15c, ton lot 24.45c, less ton 24.45c. Add 0.5c for max 0.03% Ca grade. Add 0.5c for 0.50% Fe grade analyzing min 98.25% min Si.

Alsifer: (Approx 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.85c per lb of alloy; ton lot, packed, 10.85c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, C 0.20% max). Contract, c.l. lump, bulk, 9.25c per lb of alloy. Packed, c.l. 10.45c, ton lot 11.6c, less ton 12.45c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 27.25c per lb of alloy, ton lot 28.4c, less ton 29.65c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: 100 lb or more packed (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy; less than 100 lb $1.30. Delivered. Spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over are as follows: Grade A (10-14% B) 85c per lb; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si). Carload, bulk, lump, or 3" x D, $5.25 per lb of contained B. Packed, carload $5.40, ton to c.l. $5.50, less ton $5.60. Delivered.

Carbortam: (B 1 to 2%). Contract, lump, carload $320 per ton, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 23c per lb of alloy, carload packed 24.25c, ton lot 26.15c, less ton 27.15c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.5-3%). Contract, carload, lump, bulk 24c per lb of alloy, carload packed 25.65c, ton lot 27.95c, less ton 29.45c. Delivered. Spot, add 0.25c.

BRIQUETTED ALOYS

Chromium Briquets: (Weighing approx 3⅝ lb each and containing 2 lb of Cr). Contract, carload, bulk 19.60c per lb of briquet, in bags 20.70c; 3000 lb to c.l. pallets 20.80c; 2000 lb to c.l. in bags 21.90c; less than 2000 lb in bags 22.80c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx 3 lb and containing 2 lb of Mn). Contract, carload, bulk 14.8c per lb of briquet; c.l., packed, bags 16c; 3000 lb to c.l., pallets 16c; 2000 lb to c.l., bags 17.2c; less ton 18.1c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx 3½ lb and containing 2 lb of Mn and approx ½ lb of Si). Contract, c.l. bulk 15.1c per lb of briquet; c.l. packed, bags 16.3c, 3000 lb to c.l., pallets 16.3c; 2000 lb to c.l., bags 17.5c; less ton 18.4c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx 5 lb and containing 2 lb of Si and small sizes, weighing approx 2½ lb and containing 1 lb of Si). Contract, carload, bulk 8c per lb of briquet; packed, bags 9.2c; 3000 lb to c.l., pallets 9.6c; 2000 lb to c.l., bags 10.8c; less ton 11.7c. Delivered. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each). $1.49 per lb of Mo contained, f.o.b. Langeloth, Pa.

Titanium Briquets: Ti 98.27%, $1 per lb, f.o.b. Niagara Falls, N. Y.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%). 5000 lb W or more $2.15 per lb (nominal) of contained W. Delivered.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Si 8% max, C 0.4% max). Ton lots 2" x D, $4 per lb of contained Cb; less ton lots $4.05 (nominal). Delivered.

Ferrotantalum Columbium: (Cb 40% approx, Ta 20% approx, and Cb plus Ta 60% min, C 0.30% max). Ton lots 2" x D, $3.80 per lb of contained Cb plus Ta, delivered; less ton lots $3.85 (nominal).

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Contract, c.l. packed ½-in. x 12 M 20.00c per lb of alloy, ton lot 21.15c, less ton 22.40c. Delivered. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 20c per lb of alloy, ton lot 21.15c; less ton lot 22.4c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 18.45c per lb of alloy; ton lot 19.95c; less ton lot 21.20c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

Simanal: (Approx 20% each Si, Mn, Al; bal Fe). Lump, carload, bulk 19.25c. Packed c.l. 20.25c, 2000 lb to c.l. 21.25c; less than 2000 lb 21.75c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $5 for each 1% of P above or below the base). Carload, bulk, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $120 per gross ton.

Ferromolybdenum: (55-75%). Per lb of contained Mo, in 200-lb container, f.o.b. Langeloth and Washington, Pa. $1.76 in all sizes except powdered which is $1.82.

Technical Molybdic-Oxide: Per lb of contained Mo, in cans, $1.47; in bags, $1.46, f.o.b. Langeloth and Washington, Pa.

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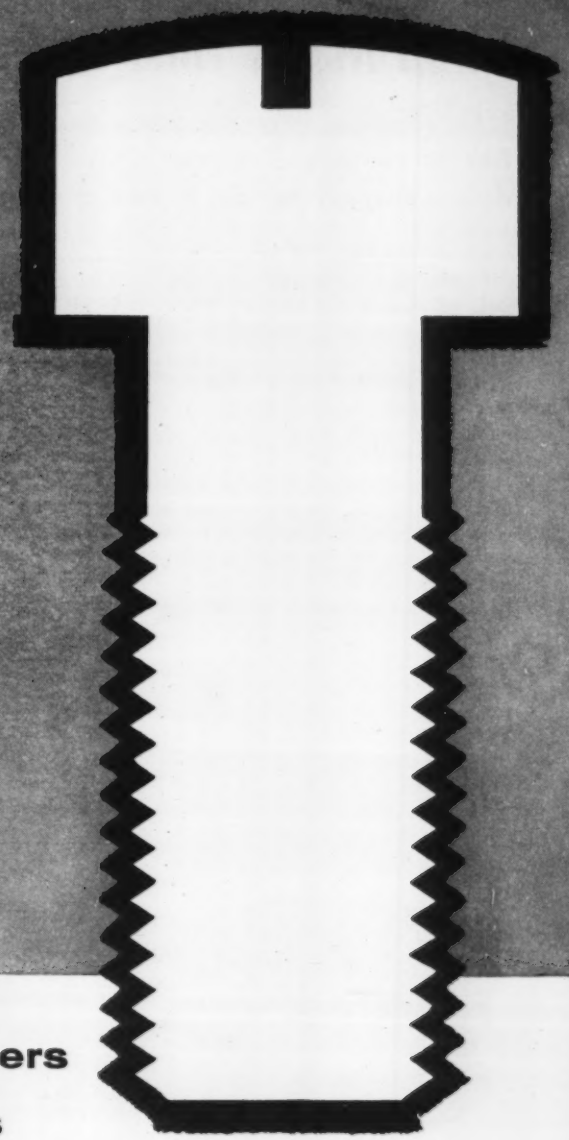

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REPUBLIC STEEL

Scrap Marks Time as Buying Lags

STEEL's composite on the prime grade holds unchanged at $42.50 for second straight week. Market sentiment firm despite sluggish demand in face of rising steel rate

Scrap Prices, Page 132

Pittsburgh—Prices are firm, but little scrap is being traded. There will be no clear indication of the market's strength until the industrial lists close. Brokers think factory bundles may not bring any more this month than they did in January unless there's a narrowing of the gap between industrial scrap and other prime grades. A major consumer would probably have to pay $46 to $48 for No. 1 heavy melting scrap if it came into the market for a representative tonnage.

Chicago—Prices on major steelmaking grades of scrap are holding despite the uptrend in steel operations. Mills have good inventories, and while a few are buying, quantities acquired are small. Supplies are plentiful.

Hurting scrap is the trend toward increased use of hot metal in open hearth charges. Of the district's 43 blast furnaces, 39 are now active. On Feb. 15, Youngstown Sheet & Tube Co. relighted its South Chicago No. 5 stack, idle since May, 1957.

Cast iron grades are strong, with foundry demand improving.

Philadelphia — Domestic demand for the steel grades is fairly lively, and the outlook for export business is more encouraging, but, except for creases on borings and turnings, prices are unchanged. Mixed borings and turnings are now quoted $22-$23, up $1, while short shoveling turnings are up $2 at $26-$27. The higher prices result from shipments to points outside the area.

Exporters expect to load one cargo here shortly, and it's reported at least one more is in prospect.

New York—Brokers' buying prices are unchanged. Demand is fairly active, both domestic and foreign, but supplies are adequate.

Cleveland — Scrap trading continues restricted, despite the continued rise in steelmaking operations. The market tone is stronger than it was some time back, though, as dealers think the mills will have to resume buying soon if inventories are to be maintained at high enough level to sustain the faster steel production pace.

Youngstown—A little more optimism is reported in the local market as the steel rate rises. There has been some buying, one mill paying $50 for No. 1 heavy melting industrial scrap, and another $48 for small quantities of No. 1 dealer scrap. The steelmakers are counting on their blast furnaces to provide enough iron to support the higher steel rate. At present, 17 of 25 district stacks are in operation.

Detroit — The market is quiet. Dealers and brokers are waiting to see what happens when monthend auto lists come out. Great Lakes Steel had a No. 2 bundle order out

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CHAMBERSBURG ENGINEERING CO.
CHAMBERSBURG, PA.

at $27, delivered, and finally filled it. There's been minor action in foundry steel, but little other business.

The feeling in the market is that prices will probably move up by the end of the month. Mills apparently are using their inventories before entering the market again. March should see more active trading.

Buffalo — Prices on cast scrap, railroad scrap, and the blast furnace grades moved up an average of $2 a ton here following recent advances on the open hearth grades. Demand for blast furnace material is improving. Foundries are taking more cast iron. The market for railroad scrap and specialties is strong, but demand is limited.

Cincinnati—There has been no new buying here to provide a market test. No. 1 heavy melting is unchanged at $39.50-$40.50. On the bullish side: A district mill brought a long idled open hearth into production. Foundry operations continue slow.

St. Louis—The market is strong, but buying pressure is uneven, keeping prices from going higher. Supplies are adequate to support steelmaking operations, but some dealers are holding much of it for better prices.

Houston—Higher Mexican prices and continuing export demand have not influenced district mill buying much. The leading Texas mill holds a 200-day inventory, but the other area producer placed an order at midmonth at higher prices. This mill's brokers are paying $35 for No. 1 heavy melting, $33 for No. 2, and $2 to $3 more on material from remote areas.

A Mexican mill returned to the market earlier this month, offering $43 and $40 for the two top grades, delivered at the border.

Export scrap is being purchased in Gulf ports for shipment to Japan. Dealers are receiving $37 for No. 1 and $34 for No. 2, delivered at the dock.

Additional Japanese purchases have pushed that country's cargo total to 97 for the fiscal year ending March 31. Scrap moving to Japan from the U. S. during the period will total about 974,400 net tons. It's reported Japanese needs for 1959 will total about 1.2 million tons.

Birmingham — Principal activity continues in the cast iron grades, most consumers buying limited quantities. The Atlanta mill, which has resumed operations after a 103-day strike, released shipments held up since October. It's expected to start buying shortly. Some scrap is moving out of the district by barge.

San Francisco—Prices are unchanged, with only limited tonnages moving out of dealers' yards. Consumers appear to have sufficient supplies for current operations.

Seattle—Buyers are continuing to fill only immediate needs. Large consumers hold ample inventories. The yards also hold large stocks. They have reduced their activities to a minimum. Exports are absent.

Structural Shapes . . .

Structural Shape Prices, Page 121

Price competition among structural fabricators is sharp. Some shops are passing up projects rather than compete for work that could be profitless.

Generally, fabricators' bookings are increasing, and the uptrend is sure to accelerate in step with the new building season. It's said that February rollings of structurals will run about 10 per cent over the January tonnage.

Shape supply is not as free as it was some time ago, but it's still far from tight. Deliveries still range two to four weeks.

There has been little pressure for inventory tonnage similar to that experienced in other product markets. This may change shortly, though, as buyers realize they'll have to get orders on mill books if they're going to protect themselves against possible strike-induced shortages this summer.

An additional 4000 tons of structurals for towers for a defense detection installation at Cutler, Maine, is being estimated. Truscon Steel Div., Republic Steel Corp., Youngstown, is fabricating 10,000 tons for this project.

Pacific Northwest fabricators are estimating on 3205 tons of shapes for a $35 million missile detection installation at Clear, Alaska. Bids will be opened in Seattle Feb. 27 by the Alaska District, U. S. Engineer. Five contracts are involved.

Bids will be asked in a few months on 45,000 to 50,000 tons for the 55-story Grand Central city office building, New York. The structure is to be built by Diesel Construction Co. from plans by Emery Roth & Sons, New York. James Ruderman, New York, is consulting engineer on steel construction.

The building will be erected behind Grand Central Terminal at an address to be known as 200 Park Ave. It will have 2.4 million sq ft of office space—believed to be the largest capacity of any commercial office building in the world.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

1500 tons, exposition buildings at Portland, Oreg., reported awarded to Poole, McGonigle & Dick, Portland; Hoffman Construction Co., Portland, general contractor, low at $5,297,000.

(*Please turn to Page* 137)

Iron and Steel Scrap

Consumer prices per gross ton, except as otherwise noted, including brokers' commission, as reported to STEEL, Feb. 18, 1959. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

Feb. 18	$42.50
Feb. 11	42.50
Jan. Avg.	40.58
Feb. 1958	37.33
Feb. 1954	26.91

Based on No. 1 heavy melting grade at Pittsburgh, Chicago, and eastern Pennsylvania.

PITTSBURGH

No. 1 heavy melting	43.00-44.00
No. 2 heavy melting	35.00-36.00
No. 1 dealer bundles	44.00-45.00
No. 2 bundles	32.00-33.00
No. 1 busheling	43.00-44.00
No. 1 factory bundles	53.00-54.00
Machine shop turnings	22.00-23.00
Mixed borings, turnings	22.00-23.00
Short shovel turnings	*26.00-27.00*
Cast iron orings	*26.00-27.00*
Cut structurals:	
2 ft and under	51.00-52.00
3 ft lengths	50.00-51.00
Heavy turnings	36.00-37.00
Punchings & plate scrap	*53.00-54.00*
Electric furnace bundles	*53.00-54.00*

Cast Iron Grades

No. 1 cupola	45.00-46.00
Stove plate	41.00-42.00
Unstripped motor blocks	31.00-32.00
Clean auto cast	39.00-40.00
Drop broken machinery	52.00-53.00

Railroad Scrap

No. 1 R.R. heavy melt.	49.00-50.00
Rails, 2 ft and under	59.00-60.00
Rails, 18 in. and under	60.00-61.00
Random rails	56.00-57.00
Railroad specialties	54.00-55.00
Angles, splice bars	54.00-55.00
Rails, rerolling	61.00-62.00

Stainless Steel Scrap

18-8 bundles & solids	225.00-230.00
18-8 turnings	120.00-125.00
430 bundles & solids	125.00-130.00
430 turnings	55.00-65.00

CHICAGO

No. 1 hvy melt., indus.	45.00-46.00
No. 1 hvy melt, dealer	42.00-43.00
No. 2 heavy melting	37.00-38.00
No. 1 factory bundles	48.00-49.00
No. 1 dealer bundles	44.00-45.00
No. 2 bundles	31.00-32.00
No. 1 busheling, indus.	45.00-46.00
No. 1 busheling, dealer	42.00-43.00
Machine shop turnings	24.00-25.00
Mixed borings, turnings	26.00-27.00
Short shovel turnings	26.00-27.00
Cast iron borings	26.00-27.00
Cut structurals, 3 ft	50.00-51.00
Punchings & plate scrap	51.00-52.00

Cast Iron Grades

No. 1 cupola	49.00-50.00
Stove plate	45.00-46.00
Unstripped motor blocks	39.00-40.00
Clean auto cast	57.00-58.00
Drop broken machinery	57.00-58.00

Railroad Scrap

No. 1 R.R. heavy melt	47.00-48.00
R.R. malleable	59.00-60.00
Rails, 2 ft and under	61.00-62.00
Rails, 18 in. and under	62.00-63.00
Angles, splice bars	55.00-56.00
Axles	72.00-73.00
Rails, rerolling	64.00-65.00

Stainless Steel Scrap

18-8 bundles & solids	215.00-225.00
18-8 turnings	120.00-125.00
430 bundles & solids	115.00-120.00
430 turnings	55.00-60.00

YOUNGSTOWN

No. 1 heavy melting	48.00-49.00
No. 2 heavy melting	35.00-36.00
No. 1 busheling	48.00-49.00
No. 1 bundles	48.00-49.00
No. 2 bundles	33.00-34.00
Machine shop turnings	20.00-21.00
Short shovel turnings	25.00-26.00
Cast iron borings	25.00-26.00
Low phos.	49.00-50.00
Electric furnace bundles	49.00-50.00

Railroad Scrap

No. 1 R.R. heavy melt.	48.00-49.00

•Nominal

CLEVELAND

No. 1 heavy melting	44.00-45.00
No. 2 heavy melting	30.00-31.00
No. 1 factory bundles	48.00-49.00
No. 1 bundles	44.00-45.00
No. 2 bundles	31.00-32.00
No. 1 busheling	44.00-45.00
Machine shop turnings	17.00-18.00
Short shovel turnings	23.00-24.00
Mixed borings, turnings	23.00-24.00
Cast iron borings	23.00-24.00
Cut foundry steel	44.00-45.00
Cut structurals, plates 2 ft and under	51.00-52.00
Low phos, punchings & plate	45.00-46.00
Alloy free, short shovel turnings	25.00-26.00
Electric furnace bundles	45.00-46.00

Cast Iron Grades

No. 1 cupola	50.00-51.00
Charging box cast	41.00-42.00*
Heavy breakable cast	41.00-42.00
Stove plate	47.00-48.00
Unstripped motor blocks	36.00-37.00
Brake shoes	39.00-40.00
Clean auto cast	50.00-51.00
Burnt cast	40.00-41.00
Drop broken machinery	53.00-54.00

Railroad Scrap

R.R. malleable	66.00-67.00
Rails, 2 ft and under	60.00-61.00
Rails, 18 in. and under	61.00-62.00
Rails, random lengths	55.00-56.00
Cast steel	52.00-53.00
Railroad specialties	53.00-54.00
Uncut tires	46.00-47.00
Angles, splice bars	54.00-55.00
Rails, rerolling	59.00-60.00

Stainless Steel

(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	215.00-220.00
18-8 turnings	120.00-125.00
430 clips, bundles, solids	115.00-125.00
430 turnings	45.00-55.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	37.00
No. 2 heavy melting	35.00
No. 1 bundles	39.00
No. 2 bundles	28.00
No. 1 busheling	39.00
Machine shop turnings	21.00
Short shovel turnings	23.00

Cast Iron Grades

No. 1 cupola	50.00
Charging box cast	40.00
Heavy breakable cast	38.00
Unstripped motor blocks	39.00
Clean auto cast	50.00
Stove plate	45.00

Railroad Scrap

No. 1 R.R. heavy melt.	*46.50*
Rails, 18 in. and under	*53.00*
Rails, random lengths	*48.50*
Rails, rerolling	61.50
Angles, splice bars	49.00

BIRMINGHAM

No. 1 heavy melting	33.00-34.00
No. 2 heavy melting	29.00-30.00
No. 1 bundles	33.00-34.00
No. 2 bundles	23.00-24.00
No. 1 busheling	33.00-34.00
Cast iron borings	14.00-15.00
Machine shop turnings	*24.00-25.00*
Short shovel turnings	*25.00-26.00*
Bars, crops and plates	43.00-44.00
Structurals & plates	*42.00-43.00*
Electric furnace bundles	39.00-40.00
Electric furnace:	
2 ft and under	37.00-38.00
3 ft and under	36.00-37.00

Cast Iron Grades

No. 1 cupola	53.00-54.00
Stove plate	53.00-54.00
Charging box cast	29.00-30.00
Unstripped motor blocks	40.00-41.00
No. 1 wheels	42.00-43.00

Railroad Scrap

No. 1 R.R. heavy melt.	38.00-39.00
Rails, 18 in. and under	51.00-52.00
Rails, rerolling	44.00-45.00
Rails, random lengths	43.00-44.00
Angles, splice bars	44.00-45.00

PHILADELPHIA

No. 1 heavy melting	40.00
No. 2 heavy melting	37.00
No. 1 bundles	41.00
No. 2 bundles	26.00-27.00
No. 1 busheling	41.00
Electric furnace bundles	42.00
Mixed borings, turnings	*22.00-23.00*
Short shovel turnings	*26.00-27.00*
Machine shop turnings	*22.00-23.00*
Heavy turnings	36.00-37.00
Structurals & plate	44.00-45.00
Couplers, springs, wheels	46.00
Rail crops, 2 ft & under	59.00-60.00

Cast Iron Grades

No. 1 cupola	39.00-43.00
Heavy breakable cast	43.00
Malleable	68.00
Drop broken machinery	49.00-50.00

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	30.00-31.00
No. 2 heavy melting	27.00-28.00
No. 1 bundles	30.00-31.00
No. 2 bundles	19.00-20.00
Machine shop turnings	11.00-12.00
Mixed borings, turnings	14.00-15.00
Short shovel turnings	15.00-16.00
Low phos. (structurals & plates)	34.00-35.00

Cast Iron Grades

No. 1 cupola	35.00-36.00
Unstripped motor blocks	24.00-25.00
Heavy breakable	33.00-34.00

Stainless Steel

18-8 sheets, clips, solids	190.00-195.00
18-8 borings, turnings	85.00-90.00
410 sheets, clips, solids	55.00-60.00
430 sheets, clips, solids	80.00-85.00

BUFFALO

No. 1 heavy melting	41.00-42.00
No. 2 heavy melting	34.00-35.00
No. 1 bundles	41.00-42.00
No. 2 bundles	29.00-30.00
No. 1 busheling	41.00-42.00
Mixed borings, turnings	*21.00-22.00*
Machine shop turnings	*19.00-20.00*
Short shovel turnings	*23.00-24.00*
Cast iron borings	*21.00-22.00*
Low phos. structurals and plate, 2 ft and under	49.00-50.00

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	*46.00-47.00*
No. 1 machinery	*50.00-51.00*

Railroad Scrap

Rails, random lengths	*51.00-52.00*
Rails, 3 ft and under	*57.00-58.00*
Railroad specialties	*50.00-51.00*

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	39.50-40.50
No. 2 heavy melting	34.50-35.50
No. 1 bundles	39.50-40.50
No. 2 bundles	26.00-27.00
No. 1 busheling	39.50-40.50
Machine shop turnings	19.00-20.00
Mixed borings, turnings	20.00-21.00
Short shovel turnings	22.00-23.00
Cast iron borings	20.00-21.00
Low phos., 18 in.	47.00-48.00

Cast Iron Grades

No. 1 cupola	45.00-46.00
Heavy breakable cast	40.00-41.00
Charging box cast	38.00-39.00
Drop broken machinery	49.00-50.00

Railroad Scrap

No. 1 R.R. heavy melt.	45.00-46.00
Rails, 18 in. and under	57.00-58.00
Rails, random lengths	50.00-51.00

HOUSTON

(Brokers' buying prices; f.o.b. cars)

No. 1 heavy melting	35.00
No. 2 heavy melting	32.00
No. 1 bundles	35.00
No. 2 bundles	22.00
Machine shop turnings	17.00
Short shovel turnings	20.00
Low phos. plates & structurals	42.00

Cast Iron Grades

No. 1 cupola	43.00
Heavy breakable	27.00-28.00†
Foundry malleable	37.00
Unstripped motor blocks	34.00

Railroad Scrap

No. 1 R.R. heavy melt.	35.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	31.00-31.50
No. 2 heavy melting	23.00-23.50
No. 1 bundles	31.00-31.50
No. 1 busheling	31.00-31.50
Machine shop turnings	11.00-11.50
Short shovel turnings	13.00-13.50
No. 1 cast	33.00
Mixed cupola cast	33.00
No. 1 machinery cast	34.00

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	38.00-39.00
No. 2 heavy melting	23.00-24.00
No. 1 bundles	39.00-40.00
No. 2 bundles	24.50-25.50
No. 1 busheling	38.00-39.00
Machine shop turnings	15.00-16.00
Mixed borings, turnings	15.00-16.00
Short shovel turnings	16.00-17.00

Cast Iron Grades

No. 1 cupola	44.00-45.00
Stove plate	33.00-34.00
Charging box cast	33.00-34.00
Heavy breakable	35.00-36.00
Unstripped motor blocks	22.00-23.00
Clean auto cast	47.00-48.00

SEATTLE

No. 1 heavy melting	31.00
No. 2 heavy melting	29.00
No. 1 bundles	29.00
No. 2 bundles	23.00
Machine shop turnings	9.00-10.00†
Mixed borings, turnings	9.00-10.00†
Electric furnace No. 1	38.00†

Cast Iron Grades

No. 1 cupola	31.00†
Heavy breakable cast	28.00†
Unstripped motor blocks	23.00†
Stove plate (f.o.b. plant)	21.00†

LOS ANGELES

No. 1 heavy melting	36.00
No. 2 heavy melting	34.00
No. 1 bundles	33.00
No. 2 bundles	18.00
Machine shop turnings	15.00
Shoveling turnings	18.00
Cast iron borings	15.00
Cut structurals and plate 1 ft and under	47.00

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	47.00

Railroad Scrap

No. 1 R.R. heavy melt.	38.00

SAN FRANCISCO

No. 1 heavy melting	32.00-34.00
No. 2 heavy melting	30.00-32.00
No. 1 bundles	30.00-32.00
No. 2 bundles	22.00
Machine shop turnings	15.00
Mixed borings, turnings	15.00
Cast iron borings	15.00
Heavy turnings	15.00
Short shovel turnings	15.00
Cut structurals, 3 ft	40.00

Cast Iron Grades

No. 1 cupola	44.00
Charging box cast	34.00
Stove plate	34.00
Heavy breakable cast	28.00
Unstripped motor blocks	31.00
Clean auto cast	40.00
Drop broken machinery	40.00
No. 1 wheels	34.00

HAMILTON, ONT.

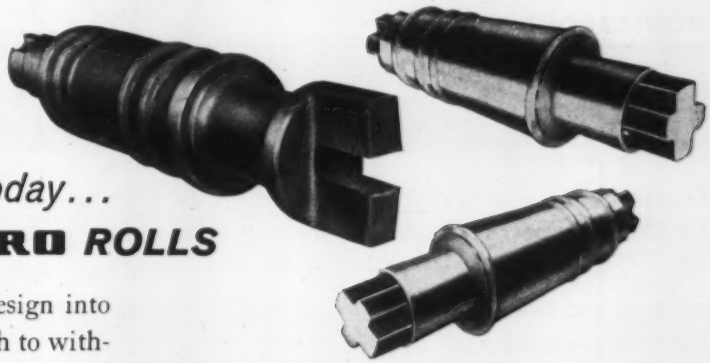
(Brokers' buying prices)

No. 1 heavy melting	34.50
No. 2 heavy melting	30.50
No. 1 bundles	34.50
No. 2 bundles	25.00
Mixed steel scrap	26.50
Mixed borings, turnings	15.00
Busheling, new factory: Prepared	34.50
Unprepared	28.50
Short steel turnings	19.00

Cast Iron Grades‡

No. 1 machinery cast	39.00-41.00

†Nominal.
‡F.o.b. Hamilton, Ont.



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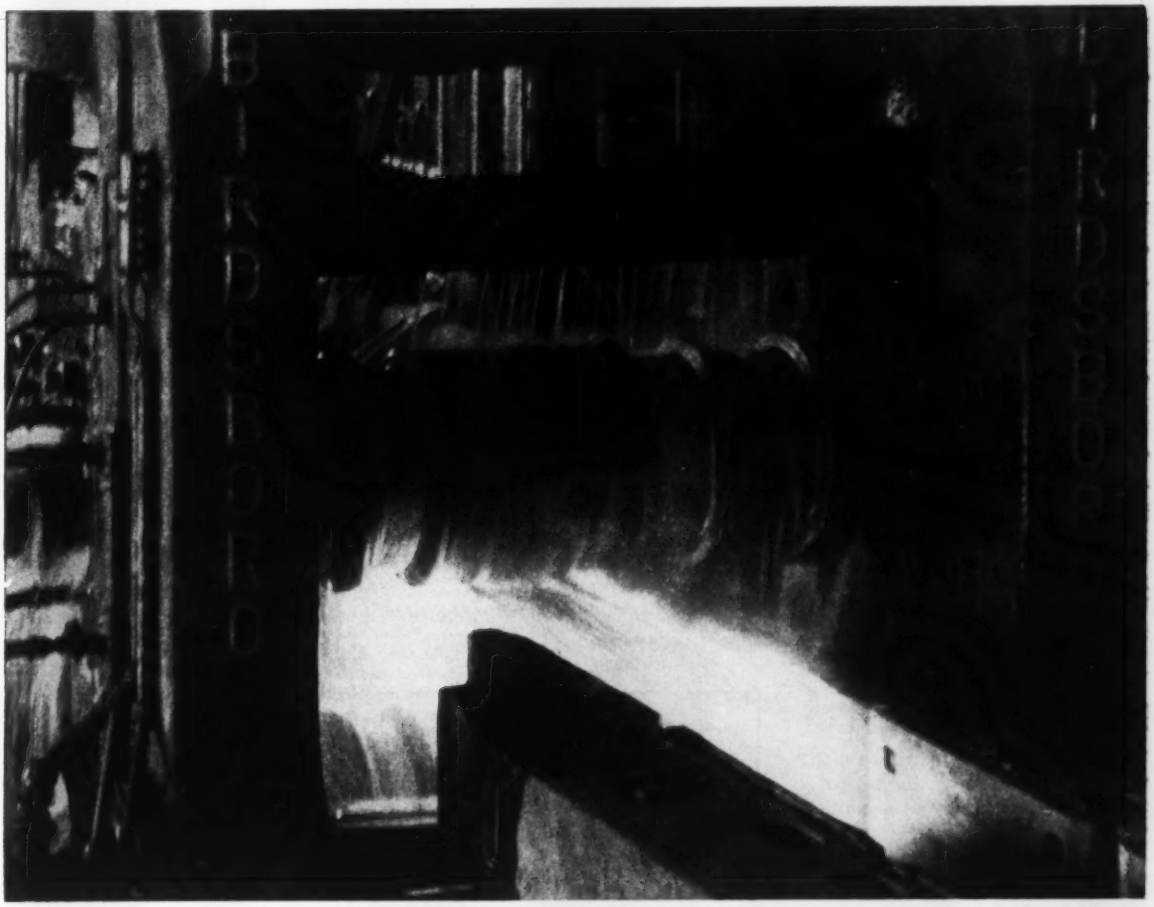

R-27-59

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U. S. Halts Copper to Reds

Government feels too many deals have been made with Red bloc since export restrictions were eased last fall. Move may signify U. S. shift in trade policy toward Soviets

Nonferrous Metal Prices, Pages 136 & 137

IN WHAT may be the prelude to a new look in trade relations with Russia, the government last week abandoned its three month "open door" policy on copper shipments to the Soviet bloc.

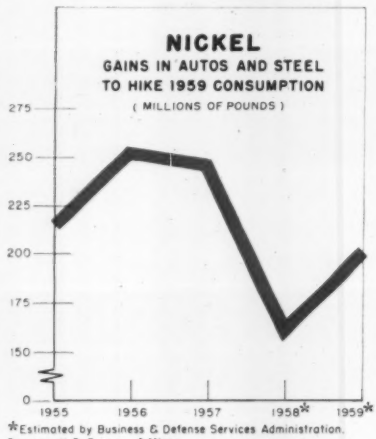
• **New Regulations**—All exports of copper and copper base materials (to every country but Canada) now have to be approved in advance by the Commerce Department. This means anyone who wants to export copper or a copper product has to apply to Commerce for a license and explain: Who the purchaser is, how he's going to use the material, and who his customers will be. In effect, the policy bars shipments behind the Iron Curtain, the presumption being a license will be denied on goods consigned to a Red postal address.

• **Turnabout**—Only last Nov. 10 former Commerce Secretary Sinclair Weeks took copper and its alloys off the list of commodities for which export licenses are required. Why the sudden reversal in policy?

The move might be the first in a complete re-evaluation of our trade policies with the Soviets. Or it may be Commerce Secretary Lewis L. Strauss's firm conviction that we are in a trade war with Russia. In a speech earlier this month, he said: "Until recently, world trade generally was in historic profit patterns. The sinister novelty introduced by the Soviets is the use of trade solely as a political weapon. . . ."

• **Too Much to Reds**—A third possible reason for Commerce's action was the "unexpectedly large" number of export applications for shipments to the Communists since the ban on copper was lifted. Shipments were approved for 7760 tons of the metal worth about $4.7 million between Nov. 10 and early February.

Some copper people believe the government may be motivated by the desire to keep copper from leaving the U. S. as a means of getting better price stability. One metalman points out that 1958 marked the first time in many years the U. S. was a net exporter of refined copper. "Because we consume more than we produce, we need to bring in copper, not ship it out."



*Estimated by Business & Defense Services Administration.
Source: U. S. Bureau of Mines.

• **Tough To Police**—Russia needs to import at least 100,000 tons of copper per year to take care of spiraling power expansion. The U. S. action is not going to keep her from getting what she needs, believe copper people. Here's why: First, our allies are not committed to follow our action and will undoubtedly continue shipments to Iron Curtain nations. Secondly, we have no machinery to police what eventually happens to U. S. copper.

Copper people don't think the export restrictions will hurt the current strong market. While several companies frankly admit Commerce's decision will curtail some of their exports, they will be able to sell to others without any trouble.

Nickel Sales To Rise

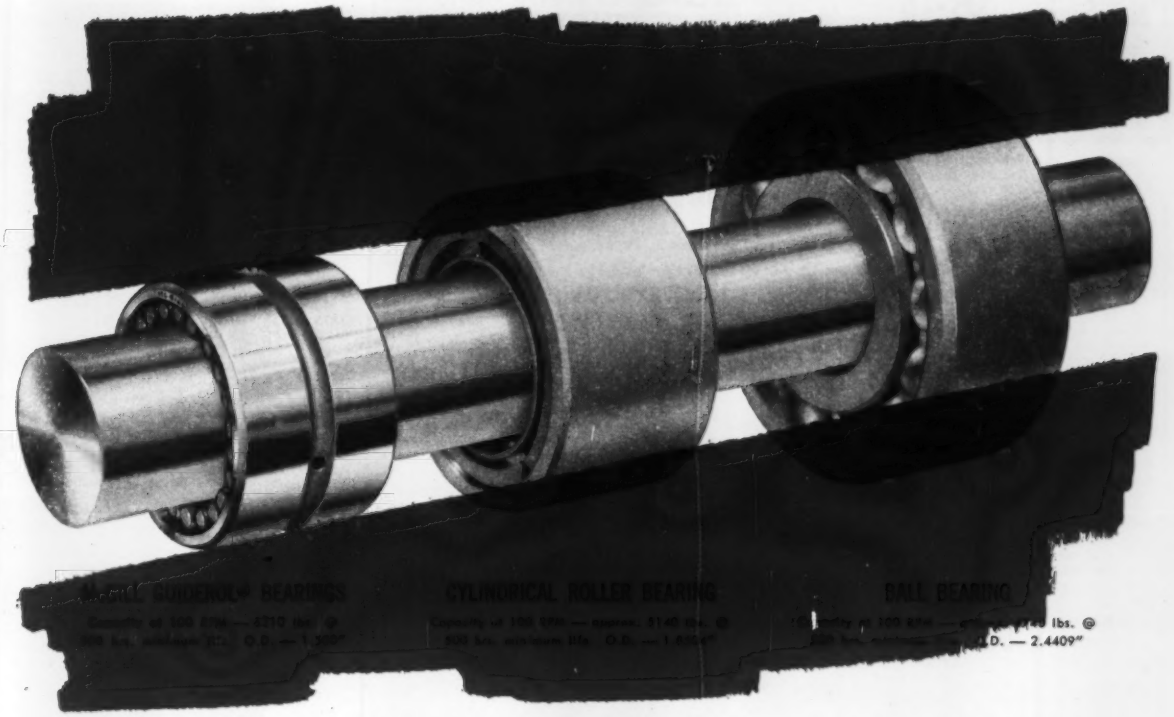
U. S. nickel consumers will use 30 million to 40 million more pounds of the metal in 1959 than they did last year, barring a prolonged strike in steel or other basic industries, believes the Business & Defense Services Administration (see chart).

Producers are banking on a continuation of the uptrend in the consumption curve. International Nickel Co. Inc. still plans to bring in its 75 million lb a year facility at Thompson, Man., sometime in early 1960. It will raise the company's production capacity to 385 million lb. Freeport Nickel Co. (subsidiary of Freeport Sulphur Co.) will come on stream this year and be at full capacity of 50 million lb in 1960. By the end of this year, Free World nickel capacity will be at 549.6 million lb; it will jump to 614.6 million next year, 676.6 million in 1961.

NONFERROUS PRICE RECORD

	Price Feb. 18	Last Change	Previous Price	Jan. Avg	Dec., 1958 Avg	Feb., 1958 Avg
Aluminum	24.70	Aug. 1, 1958	24.00	24.700	24.700	26.000
Copper	30.00–30.50	Feb. 16, 1959	30.00	29.212	28.856	24.298
Lead	11.30	Feb. 11, 1959	11.80	12.415	12.800	12.800
Magnesium	35.25	Aug. 13, 1956	33.75	35.250	35.250	35.250
Nickel	74.00	Dec. 6, 1956	64.50	74.000	74.000	74.000
Tin	102.75	Feb. 17, 1959	102.625	99.409	99.019	93.818
Zinc	11.50	Nov. 7, 1958	11.00	11.500	11.500	10.000

Quotations in cents per pound based on: COPPER, mean of primary and secondary, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary pig, 99.5+%, f.o.b. shipping point; MAGNESIUM, pig, 99.8%, Velasco, Tex.

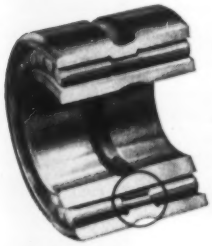


GUIDEROL® BEARINGS SAVE RADIAL SPACE

. . . . . and still offer greater load capacity

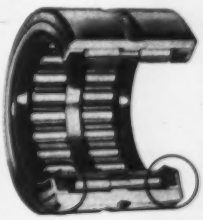
This graphic illustration demonstrates the radial space saving advantages of McGill GUIDEROL bearings that offer still greater capacity than the other two types of bearing compared. For a common 1" shaft, the GUIDEROL bearing GR-16 has an O.D. of only 1½" with a capacity of 6310 lbs. Compared to a cylindrical type roller bearing the GUIDEROL bearing requires ⅜" less housing space and offers 23% more capacity. A ball bearing for the same shaft uses almost an inch larger O.D. to carry 1500 lbs. less radial load.

CENTER GUIDED ROLLERS



GUIDEROL bearings pack more performance into smaller radial space. Their construction offers the inherent high capacity of a full complement needle bearing combined with effective roller control. Center guided rollers limit roller skewing tendencies and prevent binding under adverse conditions in either horizontal or vertical mountings. This qualifies GUIDEROL bearings for applications which are too heavily loaded for retainer type needle bearings, but are subject to misalignment that precludes the use of unguided needle bearings. Standard GR series GUIDEROL bearings are available, with or without inners, in shaft sizes from ⅝" to 9¼" with capacities ranging from 2880 lbs. to 128,670 lbs. (at 100 RPM).

LUBRICATION LOCKED IN, CONTAMINATION OUT; IN SEALED GUIDEROL BEARINGS



Pre-lubricated and sealed SG series GUIDEROL bearings are interchangeable dimensionally with standard GR series GUIDEROL bearings. They offer 5 possible seal combinations. Specify the sealed bearings for applications that are exposed to dust, dirt, grit or where accessibility for lubrication is a problem. Your McGill representative will be happy to assist you with special application problems. Ask him for recommendations or write the McGill Engineering Department.

For Complete Data on Dimensions, Capacities and Application of McGill Precision Needle Bearings, Send for Free Catalog No. 52A.

engineered electrical products

McGILL®

precision needle roller bearings

McGILL MANUFACTURING COMPANY, INC., BEARING DIV., 301 NORTH LAFAYETTE ST., VALPARAISO, INDIANA

Nonferrous Metals

Cents per pound, carlots except as otherwise noted.

PRIMARY METALS AND ALLOYS

Aluminum: 99.5%, pigs, 24.70; ingots, 26.80, 30,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 28.60; No. 43, 28.40; No. 195, 29.40; No. 214, 30.20; No. 356, 28.60; 30 or 40 lb ingots.

Antimony: R.M.M. brand, 99.5%, 29.00; Lone Star brand, 29.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 24.50-25.00, New York, duty paid, 10,000 lb or more.

Beryllium: 97% lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $74.75 per lb of contained Be, with balance as Al at market price, f.o.b. shipping point.

Beryllium Copper: 3.75-4.75% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. shipping point.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.45 per lb deld.
Cobalt: 97.99%, $1.75 per lb for 500-lb keg; $1.77 per lb for 100 lb case; $1.82 per lb under 100 lb.

Columbium: Powder, $55-85 per lb, nom.
Copper: Electrolytic, 30.00 deld.; custom smelters, 30.50; lake, 30.00 deld.; fire refined, 29.75 deld.

Germanium: First reduction, $179.17-197.31 per lb; intrinsic grade, $197.31-220 per lb, depending on quantity.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $70-80 nom. per troy oz.

Lead: Common, 11.30; chemical, 11.40; corroding, 11.40, St. Louis, New York basis, add 0.20.

Lithium: 98 + %, 50-100 lb, cups or ingots, $12; rod, $15; shot or wire, $16. 100-500 lb, cups or ingots, $10.50; rod, $14; shot or wire, $15, f.o.b. Minneapolis.

Magnesium: Pig, 35.25; ingot, 36.00 f.o.b. Velasco, Tex.; 12 in. sticks, 59.00 f.o.b. Madison, Ill.

Magnesium Alloys: AZ91A (diecasting), 40.75 deld.; AZ63A, AZ92A, 9Z91C (sand casting), 40.75, f.o.b. Velasco, Tex.

Mercury: Open market, spot, New York, $218-221 per 76 lb flask.

Molybdenum: Unalloyed, turned extrusion, 3.75-5.75 in. round, $9.60 per lb in lots of 2500 lb or more, f.o.b. Detroit.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 74.00; 10-lb pigs, unpacked, 78.25; "XX" nickel shot, 79.50; "F" nickel shot for addition to cast iron, 74.50; "F" nickel, 5 lb ingots in kegs for addition to cast iron, 75.50. Prices f.o.b. Port Colborne, Ont., incluing import duty. New York basis, add 1.01. Nickel oxide sinter at Buffalo, New York, or other established U. S. points of entry, contained nickel, 69.60.

Osmium: $70-100 per troy oz nom.

Palladium: $16-18 per troy oz.

Platinum: $57-60 per troy oz from refineries.

Radium: $16-21.50 per mg radium content, depending on quantity.

Rhodium: $118-125 per troy oz.

Ruthenium: $55-60 per troy oz.

Selenium: $7.00 per lb, commercial grade.

Silver: Open market, 90.375 per troy oz.

Sodium: 17.00 c.l.; 19.00-19.50 l.c.l.

Tantalum: Rod, $60 per lb; sheet, $55 per lb.

Tellurium: $1.65-1.85 per lb.

Thallium: $7.50 per lb.

Tin: Straits, N. Y. spot, 102.125; prompt, 102.00.

Titanium: Sponge, 99.3 + % grade A-1, ductile (0.3% Fe max.), $1.62-1.82; grade A-2 (0.5% Fe max.), $1.70 per lb.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots, $2.75-2.90 per lb nom., f.o.b. shipping point; less than 1000 lb, add 15.00; 99 + % hydrogen reduced, $3.30-3.80.

Zinc: Prime Western, 11.50; brass special, 11.75; intermediate, 12.00, East St. Louis, freight allowed over 0.50 per lb. New York basis, add 0.50. High grade, 12.50; special high grade, 12.75 deld. Diecasting alloy ingot No. 3, 14.00; No. 2, 14.25; No. 5, 14.50 deld.

Zirconium: Reactor grade sponge, 100 lb or less, $7 per lb; 100-500 lb, $6.50 per lb; over 500 lb, $6 per lb.

(Note: Chromium, manganese, and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 23.875-25.25; No. 12 foundry alloy (No. 2 grade), 21.75-22.00; 5% silicon alloy, 0.60 Cu max., 24.75-25.00; 13 alloy, 0.60 Cu max., 24.75-25.00; 195 alloy, 25.25-26.00; 108 alloy, 22.25-22.50. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 23.50; grade 2, 22.00; grade 3, 21.00; grade 4, 19.00.

Brass Ingot: Red brass, No. 115, 29.00; tin bronze, No. 225, 40.00; No. 245, 33.00; high-leaded tin bronze, No. 305, 33.25; No. 1 yellow, No. 405, 24.00; manganese bronze, No. 421, 25.75.

Magnesium Alloy Ingot: AZ63A, 37.50; AZ91B, 37.50; AZ91C, 41.25; AZ92A, 37.50.

NONFERROUS PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb; nom. 1.9% Be alloy.) Strip, $1.895, f.o.b. Temple, Pa., or Reading, Pa.; rod, bar, wire, $1.875, f.o.b. Temple, Pa.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 20,000-lb lots, 35.35; l.c.l., 35.98. Weatherproof, 20,000-lb lots, 36.29; l.c.l., 37.04.

LEAD

(Prices to jobbers, f.o.b. Bufalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more, $17.00 per cwt; pipe, full coils, $17.00 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill.) Sheet and strip, $7.50-17.00; sheared mill plate, $5.25-10.00; wire, $5.75-10.00; forging billets, $3.55-5.75; hot-rolled and forged bars, $4.25-7.50.

ZINC

(Prices per lb, c.l., f.o.b. mill.) Sheets, 26.00; ribbon zinc in coils, 21.50; plates, 20.00.

ZIRCONIUM

Plate, $12.50-19.20; H.R. strip, $12.50-22.90; C.R. strip, $15.90-31.25; forged or H.R. bars, $11.00-17.40.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheets, C.R.	126	106	128
Strip, C.R.	124	108	138
Plate, H.R.	120	105	121
Rod, Shapes, H.R.	107	89	109
Seamless Tubes	157	129	200

ALUMINUM

Sheets: 1100, 3003 and 5005 mill finish (30,000 lb base; freight allowed).

Thickness Range Inches	Flat Sheet	Coiled Sheet
0.250-0.136	42.80-47.30	....
0.136-0.096	43.20-48.30	....
0.126-0.103	....	39.20-39.80
0.096-0.077	43.80-50.00	39.30-40.00
0.077-0.068	44.30-52.20	....
0.077-0.061	....	39.50-40.70
0.063-0.061	44.30-52.20	....
0.061-0.048	44.90-54.40	40.10-41.80
0.048-0.038	45.40-57.10	40.60-43.20
0.038-0.030	45.70-62.00	41.00-45.70
0.030-0.024	46.20-53.70	41.30-45.70
0.024-0.019	46.90-56.80	42.40-44.10
0.019-0.017	47.70-54.10	43.00-44.70
0.017-0.015	48.60-55.00	43.80-45.50
0.015-0.014	49.60	44.80-46.50
0.014-0.012	50.80	45.50
0.012-0.011	51.80	46.70
0.011-0.0095	53.50	48.10
0.0095-0.0085	54.60	49.60
0.0085-0.0075	56.20	50.80
0.0075-0.007	57.70	52.30
0.007-0.006	59.30	53.70

ALUMINUM (continued)

Plates and Circles: Thickness 0.250-3 in. 24-60 in. width or diam., 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	42.40	47.20
5050-F	43.50	48.30
3004-F	44.50	50.20
5052-F	45.10	50.90
6061-T6	45.60	51.70
2024-T4	49.30	56.10
7075-T6*	57.60	64.70

*24-48 in. width or diam., 72-180 in. lengths

Screw Machine Stock: 30,000 lb base.

Diam. (in.) across flats*	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
0.125	76.90	73.90	....	....
0.250	62.00	60.20	89.10	76.60
0.375	61.20	60.00	73.50	68.50
0.500	61 20	60.00	73.50	68.50
0.625	61.20	60.00	69.80	64.20
0.750	59 70	58.40	63.60	60.40
0.875	59.70	58.40	63.60	60.40
1.000	59.70	58.40	63.60	60.40
1.125	57.30	56.10	61.50	58.30
1.250	57 30	56.10	61.50	58.30
1.350	57.30	56.10	61.50	58.30
1.500	57.30	56.10	61.50	58.30
1.625	55 00	53.60	....	56.20
1.750	55.00	53.60	60.30	56.20
1.875	55.00	53.60	....	56.20
2.000	55.00	53.60	60.30	56.20
2.125	53.50	52.10	....	....
2.250	53.50	52.10	....	56.20
2.375	53.50	52.10	....	....
2.500	53.50	52.10	....	56.20
2.625	....	50.40	....	....
2.750	51.90	50.40	....	56.20
2.875	....	50.40	....	....
3.000	51.90	50.40	....	56.20
3.125	....	50.40	....	....
3.250	....	50.40	....	....
3.375	....	50.40	....	....

*Selected sizes.

Forging Stock: Round, Class 1, random lengths, diam. 0.375-8 in., "F" temper; 2014, 42.20-55.00; 6061, 41.60-55.00; 7075, 61.60-75.00; 7070, 66.60-80.00.

Pipe: ASA schedule 40, alloy 6063-T6 standard length, plain ends, 90,000 lb base, dollars per 100 ft. Nominal pipe sizes: ¾ in., 18.85; 1 in., 29.75; 1¼ in., 40.30; 1½ in., 48.15; 2 in., 58.30; 4 in., 160.20; 6 in., 287.55; 8 in., 432.70.

Extruded Solid Shapes:

Factor	Alloy 6063-75	Alloy 6062-T6
9-11	42.70-44.20	51.30-55.50
12-14	42.70-44.20	52.00-56.50
15-17	42.70-44.20	53.20-58.20
18-20	43.20-44.70	55.20-60.80

MAGNESIUM

Sheet and Plate: AZ31B standard grade, 0.32 in., 103.10; .081 in., 77.90; .125 in., 70.40; .188 in., 69.00; .250-2.0 in., 67.90. AZ31B spec. grades, .032 in., 171.30; .081 in., 108.80; .125 in., 98.10; .188 in., 95.70; .250-2.00 in., 93.30. Tread plate, 60-192 in. lengths, 24-72 in. widths; .125 in., 74.90; .188 in., 71.70-72.10; .25-.75 in., 70.60-71.60. Tooling plate, .25-30 in., 73.00.

Extruded Solid Shapes:

Factor	Com. Grade (AZ31C)	Spec. Grade (AZ31B)
6-8	69.60-72.40	84.60-87.40
12-14	70.70-73.00	85.70-88.00
24-26	75.60-76.30	90.60-91.30
36-38	89.20-90.30	104.20-105.30

NONFERROUS SCRAP

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots.)

Copper and Brass: No. 1 heavy copper and wire, 23.75-24.75; No. 2 heavy copper and wire, 21.75-22.25; light copper, 19.50-20.00; No. 1 composition red brass, 18.25-18.75; No. 1 com-

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES e (Based on copper at 30.00c)		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tubes	Clean Heavy	Rod Ends	Clean Turnings
Copper	54.13b	51.36c	....	54.32	26.000	26.000	25.250
Yellow Brass	47.40	31.99d	47.94	50.81	19.750	19.000	18.000
Low Brass, 80%	50.13	50.07	50.67	53.44	22.125	21.875	21.375
Red Brass, 85%	51.09	51.03	51.63	54.40	23.000	22.750	22.250
Com. Bronze, 90%	52.60	52.54	53.14	55.66	23.875	23.625	23.125
Manganese Bronze	55.82	49.42	59.92	....	18.375	18.125	17.625
Muntz Metal	50.15	45.46	....	....	18.625	18.375	17.825
Naval Brass	52 08	45.89	58.64	54.49	18.375	18.125	17.625
Silicon Bronze	59.23	58.42	58.77	61.23	25.500	25.250	24.500
Nickel Silver, 10%	62.97	65.29	65.29	....	24.625	24.375	12.312
Phos. Bronze	73.82	74.32	74.32	75.50	27.000	26.750	24.750

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb.

position turnings, 17.25-17.75; new brass clippings, 15.75-16.25; light brass, 12.00-13.00; heavy yellow brass, 13.00-13.50; new brass rod ends, 14.00-14.50; auto radiators, unsweated, 14.00-14.50; cocks and faucets, 14.50-15.00; brass pipe, 14.75-15.25.

Lead: Heavy, 7.00-7.25; battery plates, 2.25-2.50; linotype and stereotype, 8.75-9.25; electrotype, 7.25-7.75; mixed babbitt, 9.25-9.75.

Monel: Clippings, 28.50-29.50; old sheets, 25.00-26.00; turnings, 20.00-23.00; rods, 28.00-29.00.

Nickel: Sheets and clips, 52.00-55.00; rolled anodes, 52.00-55.00; turnings, 37.00-40.00; rod ends, 52.00-55.00.

Zinc: Old zinc, 3.50-3.75; new diecast scrap, 3.25-3.50; old diecast scrap, 2.00-2.25.

Aluminum: Old castings and sheets, 9.75-10.25; clean borings and turnings, 6.25-6.75; segregated low copper clips, 13.00-13.50; segregated high copper clips, 13.00-13.50; mixed low copper clips, 12.00-12.50; mixed high copper clips, 11.00-11.50.

(Cents per pound, Chicago)

Aluminum: Old castings and sheets, 11.00-11.50; clean borings and turnings, 9.00-9.50; segregated low copper clips, 15.50-16.00; segregated high copper clips, 15.00-15.50; mixed low copper clips, 15.00-15.50; mixed high copper clips, 14.50-15.00.

(Cents per pound, Cleveland)

Aluminum: Old castings and sheets, 10.00-10.50; clean borings and turnings, 9.00-9.50; segregated low copper clips, 14.00-14.50; segregated high copper clips, 12.50-13.00; mixed low copper clips, 13.00-13.50; mixed high copper clips, 12.00-12.50.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 56.00; light scrap, 51.00; turnings and borings, 35.00.

Copper and Brass: No. 1 heavy copper and wire, 26.50; No. 2 heavy copper and wire, 24.75; light copper, 22.50; refinery brass (60% copper) per dry copper content, 24.00.

INGOTMAKERS' BUYING PRICES

Copper and Brass: No. 1 heavy copper and wire, 26.50; No. 2 heavy copper and wire, 24.75; light copper, 22.50; No. 1 composition borings, 21.00; No. 1 composition solids, 21.50; heavy yellow brass solids, 15.00; yellow brass turnings, 14.00; radiators, 16.00.

PLATING MATERIALS

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes, $1.45. **Copper:** Flat-rolled, 46.79; oval, 45.00, 5000-10,000 lb; electrodeposited, 38.50, 2000-5000 lb lots; cast, 41.00, 5000-10,000 lb quantities. **Nickel:** Depolarized, less than 100 lb, 114.25; 100-499 lb, 112.00; 500-4999 lb, 107.50; 5000-29,999 lb, 105.25; 30,000 lb, 103.00. Carbonized, deduct 3 cents a lb. **Tin:** Bar or slab, less than 200 lb, 121.50; 200-499 lb, 120.00; 500-999 lb, 119.50; 1000 lb or more, 119.00. **Zinc:** Balls, 18.00; flat tops, 18.00; flats, 20.75; ovals, 20.00, ton lots.

CHEMICALS

Cadmium Oxide: $1.45 per lb in 100-lb drums. **Chromic Acid (flake):** 100-2000 lb, 31.00; 2000-10,000 lb, 30.50; 10,000-20,000 lb, 30.00; 20,000 lb or more, 29.50.

Copper Cyanide: 100-200 lb, 65.90; 300-900 lb, 63.00; 1000-19,900 lb, 61.90.

Copper Sulphate: 100-1900 lb, 15.65; 2000-5900 lb, 13.65; 6000-11,900 lb, 13.40; 12,000-22,900 lb, 13.15; 23,000 lb or more, 11.90.

Nickel Chloride: 100 lb, 45.00; 200 lb, 43.00; 300 lb, 42.00; 400-4900 lb, 40.00; 5000-9900 lb, 38.00; 10,000 lb or more, 37.00.

Nickel Sulphate: 5000-22,999 lb, 29.00; 23,000-39,990 lb, 28.50; 40,000 lb or more, 28.00.

Sodium Cyanide (Cyanobrik): 200 lb, 20.80; 400-800 lb, 19.80; 1000-19,800 lb, 18.80; 20,000 lb or more, 17.80.

Sodium Stannate: Less than 100 lb, 80.10; 100-600 lb, 70.70; 700-1900 lb, 68.00; 2000-9900 lb, 66.10; 10,000 lb or more, 64.80.

Stannous Chloride (Anhydrous): 25 lb, 155.60; 100 lb, 150.70; 400 lb, 148.30; 800-19,900 lb, 107.40; 20,000 lb or more, 101.30.

Stannous Sulphate: Less than 50 lb, 140.70; 50 lb, 110.70; 100-1900 lb, 108.70; 2000 lb or more, 106.70.

Zinc Cyanide: 100-200 lb, 59.00; 300-900 lb, 57.00.

(*Concluded from Page 131*)

650 tons, plant addition at Dunkirk, Ind., for the Glass Enclosure Div., Armstrong Cork Co., Lancaster, Pa., to Belmont Iron Works, Eddystone, Pa.

130 tons, bar joists, building for Continental Can Co., Baltimore, to Truscon Steel Div., Republic Steel Corp., Youngstown.

130 tons, girder bridges, West Atchafalaya floodway crossing, St. Landry Parish, Louisiana, to Orleans Materials & Equipment Co., New Orleans; Blount Bros. Construction Co., Montgomery, Ala., general contractor.

125 tons, manufacturing building for Continental Can Co., Baltimore, to Bethlehem Contracting Co., Bethlehem, Pa.

115 tons, conveyor bridge, Scott Paper Co. plant, Everett, Wash., to Isaacson Iron Works, Seattle.

STRUCTURAL STEEL PENDING

4000 tons, towers, detection facilities, Cutler, Maine; bids March 2, Continental Electronics Mfg. Co. Inc., Boston; in addition to 10,000 tons for towers previously awarded Truscon Steel Div., Republic Steel Corp., Boston.

3205 tons, radar buildings and facilities, three contracts, bids Feb. 27 to the U. S. Engineer, Anchorage, Alaska; delivery dockside Seattle, June 15 to July 1.

3205 tons, Alaska, missile detection installation; bids to the U. S. Engineer, Alaska Division, Seattle, Feb. 27.

1535 tons, angles, General Stores Supply, Navy, Philadelphia; bids Feb. 27; also, 215 tons, carbon strip, same date.

1320 tons, six bridges, East Granby, Conn.; also 540 tons of reinforcing bars, and 550 tons of highway mesh; bids Mar. 22 to Hartford, Conn.

1250 tons, also 450 tons of reinforcing bars, 13-span composite wide flange bridge, Winooski River, Montpelier, Vt.; David Swett Co., low on the general contract.

780 tons, wide flange, General Stores Supply, Navy, Philadelphia; bids Feb. 27, two contracts; also 195 tons, T-sections, same date.

700 tons, 132 tons of cast steel, 110 tons of machinery, 90 tons of roller tracks and gears; also 11,196 sq ft of bridge decking, Lake Washington, Seattle, second floating bridge; bids to the Department of Highways, Olympia, Wash., March 3.

700 tons, steel bearing piles; also 135 tons of sheet piling; three bridges, Chelmsford, Mass.; bids Mar. 3 to Boston.

865 tons, angles, General Stores Supply, Navy, Philadelphia; bids Feb. 24; also 650 tons, carbon steel sheets, same date.

575 tons, channels, General Stores Supply, Navy, Philadelphia; bids Mar. 2; also, 705 tons, steel sheets, same date.

545 tons, 3 span girder and rolled beam bridge, Ansonia, Conn.; also 130 tons of reinforcing bars; Mariani Construction Co. Inc., New Haven, Conn., low on the general contract.

375 tons, 5-span stringer and girder bridge, interstate route 95E, Swansea, Mass.

910 tons, state highway structures, Chelmsford-Westford-Tyngsboro, Mass.; bids Feb. 25, Boston, State Highway Division, Public Works.

215 tons, also 105 tons of reinforcing bars, two composite wide flange bridges, Berlin-Montpelier-Middlesex section 1-89-3, contract 1, S. V. Rossi Construction Co. Inc., Torrington, Conn., low on general contract.

140 tons, also 65 tons of concrete reinforcing bars, state highway bridge, Fairfield, Maine; bids Feb. 25 to Augusta, Maine.

Unstated, Dickinson High School, Newark, Del.; R. M. Shoemaker, Philadelphia, awarded general contract; also required, 145 tons of reinforcing bars.

Unstated, plutonium fabricating plant, Richland, Wash.; George A. Grant Inc., Richland, low at $278,800 to the Atomic Energy Commission.

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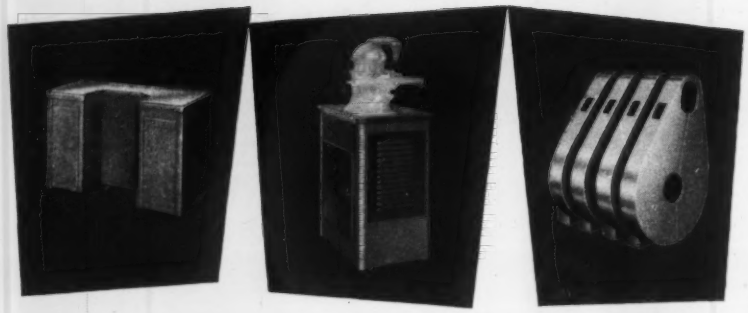
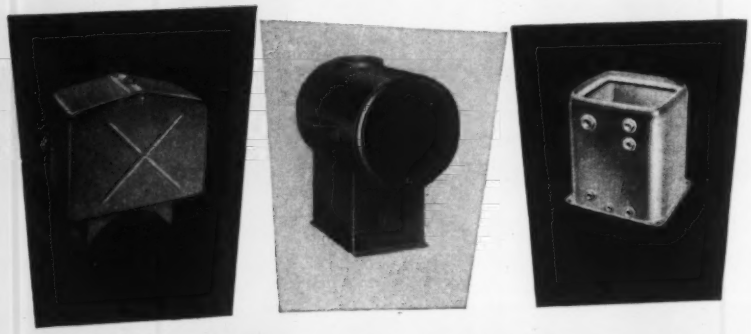
Major Chicago area structural steel fabricator seeks administrative executive to direct detailing and design phase of our entire business. Should have sound knowledge of detailing and hold Illinois structural engineer's license. Solid earlier top-grade training needed to qualify. Preferred age, 35-45. Successful candidate will face bright future with outstanding company. Our employees know of this ad. Reply briefly but completely on age, experience and personal background.

Reply Box 734, STEEL, Penton Bldg., Cleveland 13, Ohio.



COMPONENT



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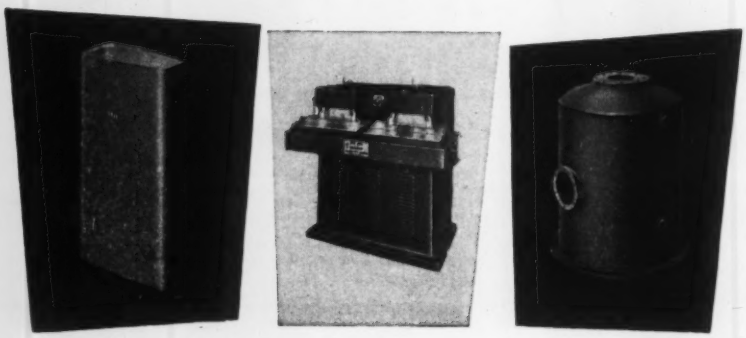

REINFORCING BARS . . .

REINFORCING BARS PLACED

1500 tons, bridges, West Atchafalaya floodway crossing, St. Landry Parish, Louisiana, to Laclede Steel Co., St. Louis; Blount Bros. Construction Co., Montgomery, Ala., general contractor.

350 tons, municipal sewage disposal plant, Bradford, Pa., to Bethlehem Steel Co., Bethlehem, Pa.

250 tons, West Chester Teachers College, West Chester, Pa., awarded by General State Authority, Harrisburg, Pa., to American Steel Engineering Co., Philadelphia.

290 tons, General Stores Supply Office, Navy, Philadelphia, to Tygart Steel Co., McKeesport, Pa.

REINFORCING BARS PENDING

5903 tons, Washington State, 1424 mile, second Lake Washington floating bridge, Seattle; bids to Olympia, Wash., March 3.

300 tons, Sears, Roebuck market, Renton, Wash.; bids in.

380 tons, addition to the municipal convention hall, Philadelphia; N. Van Campen Construction Co., Philadelphia, general contractor.

375 tons, two box girder spans, Pierce County, Wash.; bids to Olympia, Wash., March 3.

400 tons, Washington State overcrossing, Tacoma; bids to Olympia, Wash., Feb. 17.

145 tons, Dickinson High School, Newark, Del.; R. M. Shoemaker, Philadelphia, is general contractor; structural steel also required.

Unstated, 10-story apartment, Seattle; general contract to George E. Teufel Co., Seattle.

PLATES . . .

PLATES PENDING

5475 tons, General Stores Supply, Navy, Philadelphia; bids Mar. 2, two contractors.

3020 tons, hull plates, General Stores Supply Office, Navy, Philadelphia; bids March 2.

2945 tons, General Stores Supply, Navy, Philadelphia; bids Feb. 27, three contracts.

2000 tons, 28,200 ft, 48 in., ¼ in. thick, steel plate water pipe, Unit 3, Sultan River project, Everett, Wash., and alternatives; bids to John L. Sugars, clerk, Feb. 26.

645 tons, high tensile, grade Hy-80 Navy Purchasing Office, Washington; bids Feb. 27, two contracts.

195 tons, floor plates, General Stores Supply Office, Navy, Philadelphia; bids March 2.

185 tons, General Stores Supply, Navy, Philadelphia; bids Mar. 3.

PIPE . . .

CAST IRON PIPE PLACED

185 tons, 12 to 6 in., district improvement, Tacoma, Wash., to Pacific States Cast Iron Pipe Co., Seattle.

CAST IRON PIPE PENDING

300 tons, 8 to 4 in., Silver Lake, Wash.; A. J. Jacobini, Seattle, low bidder at $32,240.

STEEL PIPE PENDING

Unstated, 4000 ft of 10 in. and 6000 ft of 6 in.; also pumping equipment; bids to East Wenatchee, Wash., Feb. 26.

RAILS, CARS . . .

RAILROAD CARS PLACED

Lake Superior & Ishpeming, 200 seventy-ton ore cars to the Johnstown (Pa.) plant of Bethlehem Steel Co.

Rutland Railroad, two steel cabooses, to International Railway Car Co., Kenton, Ohio.

Cotton Belt, 100 insulated boxcars to an unnamed builder.

Denver & Rio Grande Western, 252 freight cars; 100 fifty-ton flatcars to the Johnstown (Pa.) shops of Bethlehem Steel Co., 115 fifty-ton insulated boxcars to Pacific Car & Foundry Co., Renton, Wash., and 27 seventy-ton covered hoppers and 9 seventy-ton piggyback flatcars to Pullman-Standard Car Mfg. Co., Chicago.

Argentine State Railways, 321 ballast cars, of which 287 will be equipped for broad gage and 34 for narrow gage tracks, to ACF Industries Inc., New York.

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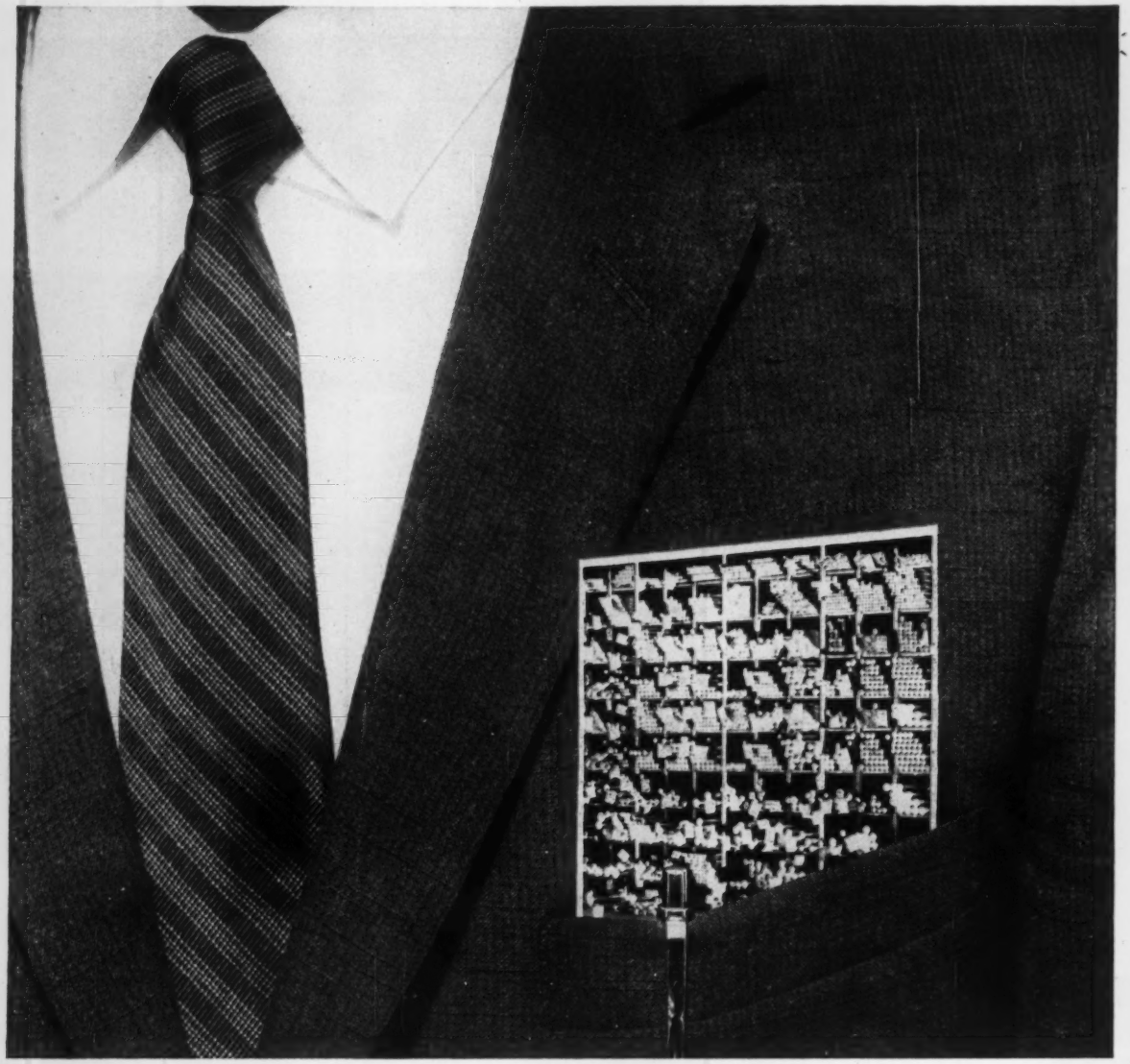
TO FIND THE MAN YOU NEED . . .

Place an advertisement in the "Help Wanted" columns of STEEL's classified pages. Your advertisement will reach the qualified men you need, because STEEL is addressed to highly-trained men in all phases of metalworking

STEEL
The Metalworking Weekly



it's like having a stainless steel warehouse in your pocket . . .

And it doesn't even take that much storage space. That's why so many plants are now saving money and labor by using the dependable stock racks of local Carpenter warehouses. There's a built-in bonus . . . it's Carpenter technical service, always on call with data and on-the-job help. The quality of Carpenter stainless has been speaking for itself for many years in thousands of plants. Your local Carpenter warehouse is the answer to inventory problems with stainless . . . call today. The Carpenter Steel Company, Reading, Pa.

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buy your horsepower at the output shaft

Speed reducer problems involve more than just gear ratios. Horsepower, torque, overhung loads and duty cycle are considerations that require performance matching of motor and reducer. When you specify Master Gearmotors you eliminate dual responsibility for overall performance.

Master Gearmotors are packaged components, engineered to meet your requirements from line voltage to keyway dimensions. Motor and reducer are built as a single, rigidly aligned unit. These compact drives offer maximum efficiency and durability at minimum cost.

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Vertical and horizontal, right angle and parallel shaft, worm, helical and herringbone gearing—⅛ thru 125 hp.

Product of Master Electric Division of Reliance Electric and Engineering Company, manufacturers of a-c. motors, Reeves Drives, V★S Drives, Super 'T', D-c. Motors, generators, controls, and engineered drive systems. E1609

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CANADIAN DIVISION: TORONTO, ONTARIO
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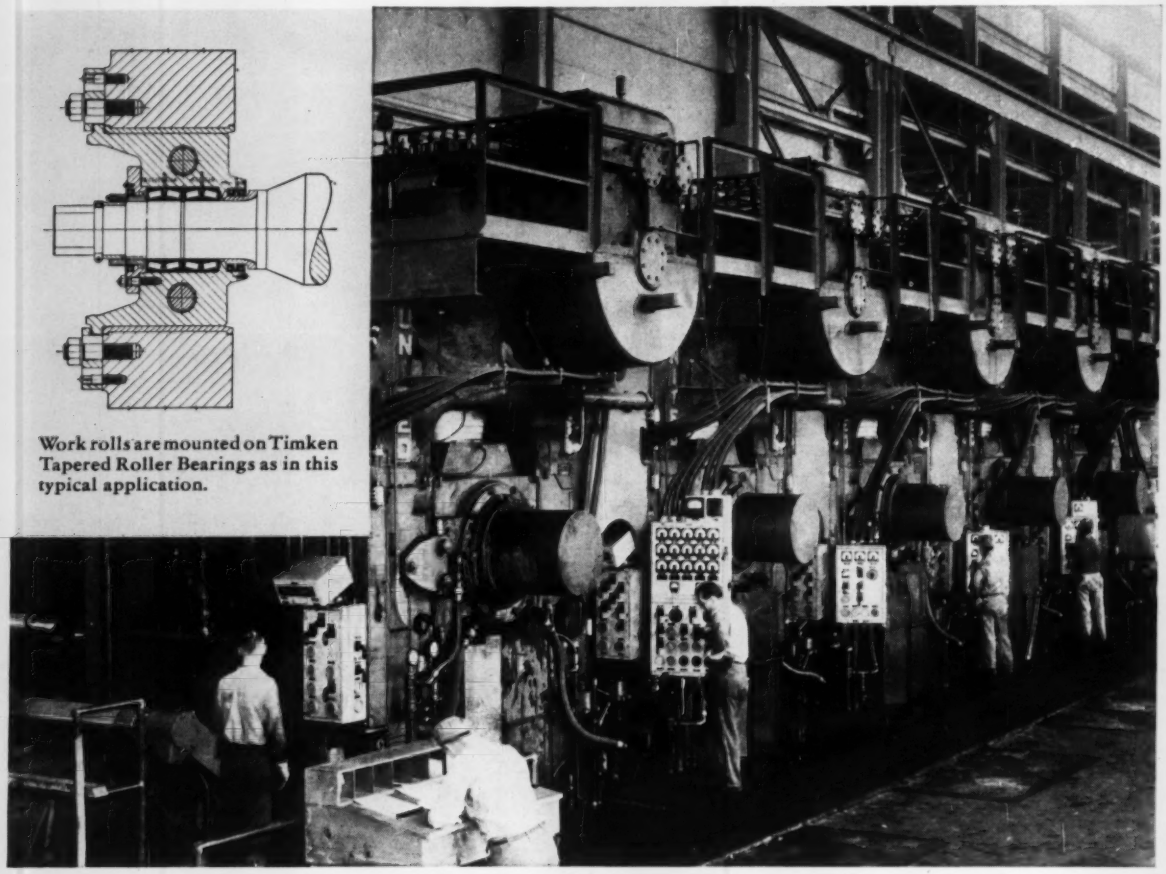
MASTER R REEVES

Work rolls are mounted on Timken Tapered Roller Bearings as in this typical application.



New design TIMKEN® bearings carry a big load at Kaiser Steel

THIS United Engineering-built 4-Hi cold mill uses a new design of Timken® bearing on the work rolls. 20 Timken tapered roller bearings in all. This mill is located at Kaiser Steel's Fontana Works, where 37 stands of hot and cold mills use Timken bearings.

With 20% greater radial and 80% greater thrust capacity, internally redesigned Timken bearings can give you greater tonnage life per bearing. And because the new design bearings give more capacity at no increase in space, they make higher performance, lower operating cost possible.

Their tapered construction lets Timken bearings take *both* radial and thrust loads. No extra thrust devices are needed—further cost-and-space savings. Because they're geometrically designed and precision-made to roll true, Timken bearings practically eliminate friction. They *roll* the loads.

These new design Timken work roll bearings are running up outstanding records because: 1) Timken advanced engineering designed these bearings specifically for the job; 2) They are precision-manufactured for longer life. Performance records by mill operators everywhere (one reports 75% more tonnage life per bearing) show that Timken work roll bearings provide lowest cost per ton of steel rolled.

Specify Timken tapered roller bearings for your new or existing mill equipment. They make machines better. And better machines do better work. That's BETTER-ness. Its symbol is the trade-mark "TIMKEN". Look for it on *your* bearings. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable: "TIMROSCO".

This symbol on a product means its bearings are the best.

BETTER-ness rolls on **TIMKEN®** tapered roller bearings